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FACULTY OF EDUCATION
The University of Alberta

EDITOR'S NOTES

AJER is one of thirty-three journals in the humanities and social sciences which have been awarded publication grants for 1972 by the Canada Council. We are grateful for this financial support which will enable us to improve the service we offer to our readers and contributors.

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In spite of the financial assistance mentioned above, we have found it necessary to increase the subscription rate. The new rate is \$6.00 per year effective immediately; the student rate and the three-year discount have been discontinued. Increasing costs in all categories of expenditures have forced these changes which are the first since 1966 and only the second in AJER's eighteen-year period of publication.

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The book review section and the detailed notes on contributors have been discontinued in favor of including at least one more article than has been normal in each issue.

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The attention of prospective contributors is drawn to the guidelines on the preparation of manuscripts which appear on the inside back cover. Publication of acceptable manuscripts is frequently delayed because authors have failed to adhere to our general style and format in the initial submission.

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We would be pleased to publish notes and comments on articles which appear in AJER. Comments which reach us by May 1st and which are accepted for publication will be included in the June issue.

E.M.

G. J. ANDERSON
and
J. P. HANRAHAN

Effects of Age of School Entrance on Intelligence¹

The purpose of this study was to determine whether any differences in a measure of mental ability taken at the grade four level could be attributed to differences in chronological age of children at the time of school entrance. Subjects consisted of 1,922 children who entered grade one in September, 1963 and who completed the Henmon-Nelson Test of Mental Abilities in grade four. This sample included children at various ages of school entrance, with and without kindergarten experience, at three levels of socioeconomic status. Analysis of variance results suggest a relationship between age of school entrance and IQ in the fourth grade for children both with and without kindergarten experience. (Dr. Anderson is Assistant Director of The Atlantic Institute of Education in Halifax, Nova Scotia; Mr. Hanrahan is currently completing doctoral studies at the University of London.)

Most North American school systems make use of a rigidly defined age-based criterion for school entrance. In any year, those children born before a certain calendar date are admitted to school a year before those born after the specified date. Thus, for some, a birthday one day earlier in the year would have required school entrance a full year earlier. As the regulations now stand such children remain in a non-school environment as much as a year longer than their peers. What are the effects of such practices on the mental development of children? Some may argue that the first grade environment is at least as intellectually stimulating as the equivalent year spent outside of school. Obviously there are differences between the classroom and the home with respect to the physical environment, peer group influence and the amount and quality of exposure to adults. These differences, moreover, presumably relate also to such factors as the sex of the child and the socioeconomic environment as represented in the home, the community, and the school. The purpose of

¹ This study was completed when both authors were in the Faculty of Education at McGill University. Thanks are extended to Richard Shaw for his assistance with data collection and analysis, to Herbert J. Walberg for comments on the paper, and to the Protestant School Board of Greater Montreal for their cooperation.

this study was to attempt to determine whether any differences in a measure of mental ability taken at the grade four level can be attributed to differences in the chronological age of children at the time of school entrance.

Early studies with disadvantaged and orphan children (Barrett & Kosh, 1930; Wells & Arthur, 1939; Skeels & Dye, 1939) report dramatic increases in measured I.Q. of children who were put in a school environment over controls who were left in the home. The Skeels & Dye (1939) sample was followed up and the initial differences appeared to be maintained a full 21 years later (see Grey & Miller, 1967). More recent investigations using culturally and organically deprived children in pre-school environments (Kirk, 1958; Deutsch, 1965; Weikart, 1967) report similar results in favor of those receiving experimental school programs.

Recent studies of culturally deprived Negro children (Grey & Klaus, 1966; Sprigle, Van de Riet & Van de Riet, 1967; Bereiter & Engelmann, 1966) also tend to report gains in I.Q. for those given enriched pre-school programs, though there is some question about the permanence of such gains (Weikart, 1967; Hanrahan, 1970). Studies of non-disadvantaged children in nursery school and kindergarten programs point to some inconsistencies. Positive effects of such programs on I.Q. have been reported by Wooley (1925), Goodenough (1928), and Gill (1967); Douglas & Ross (1964) report positive effects at age 8 but a reversal in effect at ages 11 and 15. The causal factor in all of these studies could be a result of both the specific training received and the fact that such children are admitted into a school environment at a younger age than that of their peers. If age is a factor, results imply that those entering school young tend to raise their I.Q. scores relative to controls who enter school later.

In terms of age of school entrance itself, Langerak's (1960) study is one of the most extensive. About 2,000 Iowa public school children, categorized into four age levels at the time of school entrance, formed the sample. For both sexes, with the exception of one cell, the youngest entrants had Otis Alpha I.Q.'s which at the grade two level ranged from 3 to 8 points higher than those of their older peers. Unfortunately, children who repeated any grade up to grade six were excluded from the sample. It is possible that these dropouts included a disproportionately high number of children from the lower social classes. Though less extensive, studies by Nicholson (1957), Burwin (1968), Horvath (1960) and Bellins (1963) report results consistent with those of Langerak (1960).

This study is essentially a replication and extension of Langerak's (1960) earlier work. Children at various ages of school entrance with and without kindergarten experience at three levels of socio-economic status were compared at the grade four level. The study extends Langerak's (1960) investigation by including a measure of school socio-economic status and by exploring differences in the age of entrance effect for those who attended kindergarten as contrasted to those who entered school a year later directly into first grade. Thus, the age effect on I.Q. is examined both four and five years subsequent to school entrance. It was hypothesized that differences would favor the youngest entrants and that the effects would be greater at the lower levels of socio-economic status.

Method

Procedure

The school system which participated in the study employs a September 30th deadline for school entrance such that those born October 1 do not enter grade one until they are roughly 83.5 months of age; whereas children born September 30 enter grade one at age of 72.5 months. For purposes of analysis, the subjects were divided into those born in each of the four quarters of the year (January-March, April-June, July-September, October-December) and having mean ages at entrance to grade one of 79.5 months, 76.5 months, 73.5 months, and 82.5 months, respectively.

It was not considered feasible to classify each pupil according to his individual socio-economic status (SES). Alternatively, each of the schools in the study was rated both by employees of the school system and according to census data, and the resulting three levels of SES were applied to each of the pupils in a particular school. Thus the measure of SES employed is essentially a school variable, rather than a characteristic of the individual subject.

Although school attendance is compulsory from the grade one level, some parents choose not to send their children to kindergarten. In order to determine whether or not effects would differ for the kindergarten and non-kindergarten groups, separate analyses were made for each of the two subsamples as well as for the total sample. Thus a determination of the relationship between age at school entrance and I.Q. was obtainable when the entrance took place in kindergarten or a year later, directly to grade one. We should emphasize that normally the kindergarten effect would have been included as a factor in the design. We chose not to do so for two reasons: first, the absence of recorded kindergarten attendance is not sufficient evidence to insure that a child in fact did not attend; second, the decision to keep a child at home is not a random effect. Thus, the kindergarten effect as measured here is "messy" and it was not considered justifiable to increase the complexity of the analysis by including it as a main effect.

In the school system used in the study, the Henmon-Nelson Test of Mental Ability (Lamke & Nelson, 1957) is completed by all fourth grade children during a one-week period in the fall of the year. The test purports to measure "those aspects of mental ability which are important for success in academic work and in similar endeavors outside the classroom (Lamke & Nelson, 1957, p. 3)", and has a reliability of approximately .95. The tests are group-administered and are scored on the basis of age, the difference between age levels being three months. Test scores were taken from the permanent files on each child.

A 2 (Sex) x 3 (SES) x 4 (Age) analysis of variance was completed for kindergarten, non-kindergarten, and pooled samples separately. As the main effects of sex and SES are not the subjects of this investigation, only their interactions with the age effect will be considered in the subsequent discussion.

Sample

Fifty-eight schools in the Montreal Metropolitan area provided 1922 English speaking Protestant subjects who had entered the school system

in September, 1963 and who had completed the Henmon-Nelson Test of Mental Abilities (Lamke & Nelson, 1957) in grade four. An additional eighteen schools considered to contain a majority of children with mainly non-native Canadian ethnic backgrounds were excluded. Pupils who had repeated grades were sought out and also included in the analysis.

The breakdown of the total sample by age at school entrance and SES is shown in Table 1. Cell sizes for the two subsamples have not been included to conserve space; relevant tables are available from the authors.

TABLE 1
CELL SIZES FOR TOTAL SAMPLE

Average Age at School Entrance	High SES		Middle SES		Low SES		Total
	M	F	M	F	M	F	
73.5 mos.	94	81	88	81	68	79	491
76.5 mos.	107	102	86	87	74	74	530
79.5 mos.	83	91	82	71	71	70	468
82.5 mos.	84	60	80	61	72	76	433
Total	368	334	336	300	285	299	1922

Results and Discussion

Cell means and standard deviations for the two subsamples are also available from the authors; statistics for the pooled sample are shown in Table 2. Table 3 summarizes the results of the three analyses of variance.

TABLE 2
CELL MEANS AND STANDARD DEVIATIONS FOR TOTAL SAMPLE

Average Age at School Entrance	High SES		Middle SES		Low SES	
	M	F	M	F	M	F
73.5 mos.	115.73	113.43	114.83	116.02	107.15	112.44
	11.72	20.73	13.19	9.59	9.87	10.76
76.5 mos.	112.22	117.19	113.19	112.01	108.18	110.57
	11.20	9.98	11.34	12.53	12.62	11.01
79.5 mos.	113.11	115.36	112.04	111.54	105.45	107.53
	11.85	9.45	13.33	11.64	17.18	17.00
82.5 mos.	108.69	115.48	109.68	107.75	103.54	107.58
	11.98	10.64	12.97	22.89	10.17	17.29

TABLE 3

ANALYSIS OF VARIANCE RESULTS FOR TOTAL, KINDERGARTEN,
AND NON-KINDERGARTEN SAMPLES

Source	Total Sample		Kindergarten Sample		Non-Kindergarten Sample	
	<i>F</i>	<i>P</i>	<i>F</i>	<i>P</i>	<i>F</i>	<i>P</i>
<i>Main Effects</i>						
SES (A)	35.3	.0001	27.4	.0001	11.3	.0001
Sex (B)	11.3	.0008	20.1	.0001	.2	.6539
Age (C)	10.2	.0001	3.7	.0121	6.9	.0002
<i>Interactions</i>						
AB	4.2	.0153	2.3	.1027	2.6	.0780
AC	.9	.5079	0.4	.8953	1.3	.2722
BC	.5	.7161	3.1	.0265	2.6	.0545
ABC	2.1	.0515	1.4	.2030	1.6	.1198

The overall results (see Table 3) suggest statistically significant findings for the main effects, a significant SES x Sex interaction in the total sample and a significant Sex x Age interaction in the kindergarten group, and approaching significance ($p = .0545$) in the non-kindergarten sample. Significance for the three-way interaction was approached in the total sample only ($p = .0515$). Table 2 shows a trend for those who entered school youngest to score highest on the measure of mental ability. The progression reverses, however, in the sample of High SES females. With this exception, only 10 of the remaining 60 cell means are out of sequence, implying that the I.Q. difference increases as the age difference increases.

Several mechanisms might be implicated in the findings. Those who delay entering either kindergarten or grade one lose some of their friends who are going to school and become involved with younger, perhaps less competitive peer groups. When they do enter school, a similar pattern prevails. Because of their greater physical maturity and school readiness, the older children receive little competition or challenge from the younger members of the class. Perhaps more significant, they probably also receive less attention from the teacher who is likely to expect more from older children and be more concerned with the needs of the younger pupils. Thus, it is possible that for older children the restrictions on opportunities for growth resulting from late school entrance occur both before and after the child enters school. Children who enter school at a young age, leave the home environment before becoming bored with it and enter the school where they are forced to compete with a more physically and mentally mature group of classmates. It is possible that children unable to compete with older peers will be forced to seek teacher approval as their only means of positive reinforcement.

The Sex x Age interaction in the two subsamples results largely from the less prominent age trend for girls as compared to boys. In several

cases girls who entered young scored lower than did their older classmates—a reverse trend to that observed for boys. In any case, the trends for females are on the whole less obvious than that for males. It is unclear whether these results are artifacts of this particular sample or are produced by legitimate, though yet unexplainable, effects.

In interpreting the results we must stress that causality has not been established. An examination of the cell sizes for the various samples implies that there are fewer children born in the fall and winter months than in spring and summer. It is possible that the more intelligent parents plan the births of their children for these warmer times of the year and that the results are biased for this reason. The effects of season of birth, though unclear, are also not to be underestimated. In cold climates, children born in spring will receive outdoor stimulation more frequently in their first months of life than will those born during fall and winter.

Returning to the hypotheses, while the main age effect supported the hypothesis of higher scores for youngest entrants, the effect was not related to the level of SES of the sample; thus the other hypothesis was not supported. It is noteworthy that the main effect of SES is extremely strong. Recalling that SES as measured here is a school variable, the tendency for school SES to be related to the mental ability of pupils is not surprising. Whether individual measures of parental SES would reveal a significant SES x Age interaction remains to be investigated.

In conclusion, the findings suggest a relationship between age of school entrance and I.Q. in the fourth grade both for children who entered kindergarten and for those entering directly into grade one. There is a need to further replicate the study using older subjects to determine whether the relationship stands up over increased lengths of time. Most important, however, is the need for tightly controlled experimental studies which would provide differential treatments for different groups of children. Also, steps could then be taken to assess the relative weights of pre-school and school-related experience.

References

- Barrett, H. E., & Kosh, H. L. The effect of nursery school training upon the mental test performance for a group of orphanage children. *Journal of Genetic Psychology*, 1930, 37, 102-122.
- Bellins, R. D. Mental and educational growth patterns in relation to school entrance age. Unpublished Doctoral Dissertation, Boston University, 1963.
- Bereiter, C., & Engelmann, S. *Teaching disadvantaged children in the preschool*. Englewood Cliffs, New Jersey: Prentice-Hall, 1966.
- Burwin, B. R., et al. An analysis of the relationship of school entrance age to mental age and school achievement in grades one, three, five and eight. Unpublished Doctoral Dissertation, Boston University, 1958.
- Deutsch, M. *Institute for developmental studies: Annual report*. New York: New York Medical College, 1965.
- Douglas, J., & Ross, J. The later educational progress and emotional adjustment of children who went to nursery schools or classes. *Educational Research*, 1964, 7, 73-80.

- Gill, M. P. Relationship between junior kindergarten experience and readiness. *Ontario Journal of Educational Research*, 1967, 10, 57-65.
- Goodenough, F. A preliminary report on the effects of nursery school training upon the intelligence test scores of young children. *Yearbook, National Society for Studies in Education*, 1928, 27, Part I, 361-369.
- Grey, S. W., & Klaus, R. A. The Early Training Project: An intervention study and how it grew. *Journal of School Psychology*, 1966, 4, 15-20.
- Grey, S. W., & Miller, J. D. Early experience and cognitive development. *Educational Research*, 1967, 37, 474-493.
- Hanrahan, J. P. Effects of early school entrance on intelligence. Montreal, McGill University, unpublished M.A. Thesis, 1970.
- Horvarth, J. B. An analysis of the relationship of school entrance age to mental age and school achievement in grade one. Unpublished Doctoral Dissertation, Boston University, 1960.
- Kirk, S. A. *Early education of the mentally retarded*. Urbana, Illinois: University of Illinois Press, 1958.
- Lamke, T. A., & Nelson, M. J. *The Henmon-Nelson Tests of Mental Ability: Examiner's manual*. Boston: Houghton-Mifflin, 1957.
- Langerak, R. Sex and school entrance age as factors related to certain skills in achievement. Doctoral Dissertation, University of Nebraska, Ann Arbor, Michigan: University Microfilms, 1960, No. 60-5564.
- Nicholson, A. K. Background abilities related to reading success in first grade. Unpublished Doctoral Dissertation, Boston University, 1957.
- Skeels, H. M., & Dye, H. B. A study of the effects of differential stimulation on mentally retarded children. *Proceedings of the American Association for Mental Deficiency*, 1939, 44, 114-136.
- Sprigle, H. A., Van de Riet, V., & Van de Riet, H. A sequential learning program for preschool children and an evaluation of its effectiveness with culturally disadvantaged children. Paper read at the American Educational Research Association, New York, March 1967.
- Weikart, D. P. Preschool programs: Preliminary findings. *Journal of Special Education*, 1967, 1, 163-181.
- Wells, J. & Arthur, G. Effects of fosterhome placement on the intelligence ratings of children of feeble-minded parents. *Mental Hygiene*, 1939, 23, 277-285.
- Wooley, H. T. The validity of standards of mental measurement in young children. *School and Society*, 1925, 21, 476-482.

J. J. BERGEN

and

D. DEISEACH

Dimensions of the High School Student's Role

Six dimensions of role were identified in a study of the high school student's role as perceived by first-year education students. The sample tended to agree strongly with these dimensions as legitimate aspects of the high school student's role. Differences in attitude towards the role were found to be related to the type of school attended but not to such personal variables as sex, socio-economic background, or teacher education route. The importance of defining the role of the high school student is stressed as an initial step in attempting to find a more meaningful part in the school organization for the student. (Dr. Bergen is an Associate Professor and Mr. Deiseach is a doctoral student in the Department of Educational Administration at The University of Alberta.)

Social psychologists (McGregor, 1960; Argyris, 1964; Maslow, 1964) have identified the problem of providing for individual needs within the organization as a central issue in motivating the members of the organization. One possible solution lies in "job enlargement" (Schein, 1965, p. 32); that is, broadening a member's role in order to increase his motivation and his sense of identification with the work, and in order to satisfy his need for meaningful activity, autonomy, and self-fulfillment. The school is an organization and the student is one of its members. The student's needs, as these may be identified in part by examining his perception of his role, ought not to be overlooked.

Problem

It is useful to examine the role of the high school student and to discover organizational adjustments that would make his participation in the school more meaningful. Not to do so invites an increase in student alienation, which is characterized by a sense of powerlessness to influence his situation in school, a loss of meaning in which the relevance of schoolwork is questioned, and a sense of isolation from the larger

society within the peer-group (Blauner, 1964). These symptoms can be recognized in the descriptions by commentators on the social condition of the high school student (Friedenberg, 1965; Grambs, 1965). Evidence from the Canadian scene on student disenchantment can be found in Scragg's (1968) investigation of the dropout in Alberta, and Friesen's (1967) identification of the potential dropout—one who would leave school if given the opportunity. Recent literature on student unrest advocates a more active role for the high school student, a share in the administrative decisions of the school and a greater measure of freedom and responsibility for learning.

Before any role enlargement decisions can be taken, however, a description of the high school student's role must be found. This was done for the present study (Deiseach, 1969) by asking 110 first-year education students to respond to an instrument containing a list of statements concerning the student's role. The sample was confined to those students who completed high school in the previous year since recency of high school experience was considered to be important. The problem was expressed operationally in the following questions: (1) What were the dimensions of the high school student's role as described by first-year education students?; (2) What was the extent of their agreement on these dimensions?; and (3) What differences in the perception of these dimensions were discernible when the respondents were compared on personal and social variables, and on characteristics of the high school they had attended?

Design of Study

A questionnaire entitled *The Role of the High School Student*¹ was used to elicit the perceptions of the student's role from the respondents. This was an attitude inventory of the Likert type consisting of fifty-two items in which the respondents were asked to indicate their relative agreement with each by circling the appropriate number on a seven point agree-disagree continuum. The items were normative statements, based on a review of literature and the experience of administrators, and were related to student behavior and attitudes in areas such as: school rules and regulations; school program; staff-student relations; peer-group relations; and, student participation in decision-making. The following is an example:

You think or feel the high school student ought . . .
to feel free to boycott classes

1 2 3 4 5 6 7

A pilot study was carried out with the initial version of the instrument and the Kuder-Richardson (KR 20) formula was used to measure the scalability of the items on both forms of the questionnaire as a test of internal consistency (Ferguson, 1966, pp. 379-380). Item analysis of the responses yielded KR 20 reliability coefficients of 0.52 for the pilot study, and 0.69 for the present study.

¹ This instrument was compiled initially by J. J. Bergen, in collaboration with D. Friesen and C. S. Bumbarger, at The University of Alberta. The revised edition which was used in this study was the work of J. J. Bergen and D. Deiseach.

Information on the respondent's background was solicited through an individual data sheet in the following categories: sex, teacher preparation route (elementary or secondary), socio-economic standing, organizational structure of the high school attended (Grades I-XII, junior-senior high, or high school), type of school (public or non-public), size of the school (number of high school teachers), and location of the high school (urban, town, or country). For each of the seven categories, a null hypothesis of no significant difference between student's perceptions of the high school student's role was formulated, e.g., "There is no significant difference between students who attended urban, town, and country high schools in their perceptions of the high school student's role."

In the treatment of the data, factor analysis with Kaiser's varimax method (Harman, 1967, pp. 301-308) was used to resolve the fifty-two items of the principal instrument into a small number of factors or dimensions in order to obtain a parsimonious description of the student's role. Two criteria were used to decide the appropriate number of factors. The first criterion was to choose the number of factors beyond which a break occurred in the eigenvalue curve (Horn, 1965; Linn, 1968). The second criterion was to select the largest number of factors which lent themselves to a meaningful interpretation (Kelley, 1940). Six factors were found to provide a description of the high school student's role as perceived by beginning education students. Factor scores were found by calculating the average of a respondent's scores across the items associated with each factor. A low factor score indicated agreement with the student behavior and attributes in a factor. The one-way analysis of variance technique was applied to these factor scores to test the hypotheses in the study. When three or more groups were compared, the Scheffé multiple comparison of means test was employed (Ferguson, 1966) to locate the groups between which the significant differences lay.

Findings

The six dimensions were given what was thought to be appropriate titles. They are described here in terms of the items to which they relate.

Student Conformity. Items associated with this factor described the attitudes of a student who was inclined to cooperate with the school administration, to adhere to convention, and to conform to school rules and regulations. He was disposed to please others, to try to be accepted by them, and to behave in ways that anticipated the approval of his superiors. He was opposed to behavior he deemed to exceed the bounds of propriety, or that evaded school rules.

Student Participation. Items in this factor related to student participation in the administration of the school and representation in making decisions affecting many aspects of school government. The student who tended to agree strongly with these items desired a voice in determining certain features of the curriculum program that controlled his progress through school. Another ingredient of this disposition was a belief in the right of students to challenge existing values and to use group tactics as a means of expressing student opinion.

Student Criticism. Strong agreement with this factor emphasized the

individual student's right to express criticism of institutional policies and practices. Attitudes that manifested an individual sense of responsibility and intellectual forthrightness were prevalent. A student so disposed appeared to be concerned that the school organization did not hinder his scholastic progress and that the quality of the learning experiences were not impoverished by dull routine.

Student Challenge. Strong agreement with the items of this factor suggested a greater emphasis on the rights of students to challenge the existing order. Students sought to place the student body on an equal footing with staff members. On the other hand, there was a relative lack of emphasis on individual responsibility and on intellectual independence.

Individual Quest. Items in this factor related to attitudes that might have been ascribed to a student who was concerned that the school serve him adequately as an individual seeker of knowledge. Learning as an inquiry process was stressed, and the freedom to engage in the corresponding activity within the school organization was sought.

Student Socializing. Agreement with items in this factor suggested being involved in social activities with students and staff. Group involvement in this case seemed to have been hedonistic and uncritical, rather than purposeful in the political sense.

A frequency distribution of factor scores for the six dimensions of the high school student's role is shown in Table 1. The preponderance of scores fell in the agreement end of the continuum for the first five factors, and to a lesser extent for the sixth. The inference drawn from this was that the sample showed some form of consensus on what they felt the role of the high school student ought to be, and that the six factors found in the study were perceived as legitimate dimensions of that role. That the respondents should have shown agreement with two apparently contradictory aspects of the student's role, Student Conformity and Student Challenge, indicated that the role was regarded as flexible—there was a time to conform and a time to dissent.

No significant differences were found in factor scores for the six dimensions of the high school student's role between first-year education students classified on the basis of sex, teacher preparation route, and socio-economic status. The first three hypotheses were, therefore, accepted.

Some significant differences in perceptions, as indicated by factor scores, were found among respondents based on three variables of the high school from which they graduated, size, type, and location. These were as follows: (1) students from private and separate schools showed more agreement with the dimension of Student Socializing than did students from public schools; (2) students from small high schools of ten or fewer teachers showed more agreement with Student Socializing than did students from large high schools of more than thirty teachers; (3) students from city schools showed more agreement with Student Criticism, Student Challenge, and Individual Quest than did students from town schools; and (4) students from rural schools showed more agreement with Student Socializing than did students from city schools. No significant differences were found for the remaining variable, type of high school organization. Thus, only the hypothesis of no significant differences in

TABLE 1
FREQUENCY DISTRIBUTION OF FACTOR SCORES FOR SIX FACTORS OF
THE HIGH SCHOOL STUDENT'S ROLE (N = 110)

<i>Factors</i>	Agree Very Strongly (1)* 0.5-1.5	Agree Strongly (2) 1.5-2.5	Agree Somewhat (3) 2.5-3.5	Undecided (4) 3.5-4.5	Disagree Somewhat (5) 4.5-5.5	Disagree Strongly (6) 5.5-6.5	Disagree Very Strongly (7) 6.5-7.5	Means	Standard Deviations
I Student Conformity	15	69	24	1	1	0	0	2.13	0.68
II Student Participation	9	34	58	7	2	0	0	2.63	0.80
III Student Criticism	30	66	14	0	0	0	0	1.85	0.62
IV Student Challenge	2	30	57	21	0	0	0	2.88	0.73
V Individual Quest	1	32	57	20	0	0	0	2.87	0.71
VI Student Socializing	0	9	42	54	4	0	1	3.52	0.77

*Class interval = 0.5-1.5, midpoint of interval = 1, exact limits of interval = 0.5-1.49.

perceptions of the role of the high school student between first-year education students from high schools of different organizational type was accepted.

Discussion

Differences in attitudes towards the role of the high school student among first-year education students were found to be related to the kind of high school attended, but not to the personal variables of sex, teacher education route, and socio-economic standing. These findings differ from those of previous research (MacLean, Gowan, and Gowan, 1955; Ratsoy, 1965) where attitudes of first-year education students were examined. MacLean, Gowan, and Gowan found attitudinal differences among male and female students on theoretical, political, social, aesthetic, economic, and religious orientation variables. Ratsoy found differences among students classified by sex, teacher education route, and socio-economic stand-

ing on theoretical orientation, professional orientation, and aestheticism. The disaccord was probably due to the subject of inquiry in each case: the studies mentioned were addressed to general variables, and "the differences noted could be simply a reflection of broad culturally based sex differences that one would expect to find in any occupational group (Ratsoy, 1965, p. 116)"; this study, however, was concerned with a specific issue, the role of the high school student. Further research on attitude differences among first-year education students categorized by personal variables may not be fruitful when it deals with a limited topic such as this one.

Perceptions of the high school student's role held by first-year education students may depend principally on their own experiences in high school. In this respect, there are important differences between high schools: students who graduated from city schools showed more agreement with Student Criticism, Student Challenge, and Individual Quest, than did students from town schools. This suggests that students of a city school may be more aware of their political role than their counterparts in town schools are. Alternatively, students who attended a small rural high school were more likely to register a strong agreement with Student Socializing than students from a large city school. Evidently, it may be easier to achieve a more acceptable climate in a small school than in a large school by improving the extent of social involvement and staff-student relationships.

These findings have a special significance for principals and teachers. The quality of a student's experiences in the high school affects his later expectations for the high school student's role in the school organization when he becomes a teacher. A case could be made that innovations which tend to enlarge the student's role have a lasting effect and help to prepare future teachers to accept a broader interpretation of the high school student's membership in the organization. As a guide to discovering methods by which the student's role might be enhanced, the six dimensions found in this study deserve special attention. What arrangements can be made, for instance, to accommodate the Individual Quest dimension in the school organization? Consideration ought to be given to freedom for individual study during the school day, to the extent to which class attendance should be obligatory, and to adequate time for teachers to act as advisors to students. The dimension of Student Participation implies that structures be instituted through which students can have a real say in decisions which affect them. Student Criticism and Student Challenge dimensions indicate the desirability of a positive attitude towards student opinion and a constructive utilization of student ideas. The Student Socializing dimension points to the contribution which joint staff-student activities can provide to make students feel accepted in the organization. An analysis of these dimensions in the context of a particular school may encourage the principal and his staff to extend the student's participation in the organization.

References

- Argyris, C. Human behavior in organizations. *Modern organization theory*, Mason Haire, editor, New York: John Wiley and Sons Inc., 1961.
- Blauner, R. *Alienation and freedom*. Chicago: University of Chicago Press, 1964.
- Deiseach, D. Beginning education students' perceptions of the role of the high school student. Unpublished masters thesis, The University of Alberta, Edmonton, 1969.
- Ferguson, G. A. *Statistical analysis in psychology and education*. New York: McGraw-Hill Book Company, 1966.
- Friedenberg, E. G. *The dignity of youth and other atavisms*. Boston: Beason Press, 1965.
- Friesen, D. Profile of the potential dropout. *Alberta Journal of Educational Research*, 1967, 13, 299-310.
- Grambs, J. D. *Schools, scholars, and society*. New Jersey: Prentice-Hall Inc., 1965.
- Harman, H. H. *Modern factor analysis*. Chicago: University of Chicago Press, 1967.
- Horn, J. L. A rationale and test for the number of factors in factor analysis. *Psychometrika*, 1965, 30, 179-186.
- Kelley, T. L. Comment on Wilson and Worcester's "Note on factor analysis". *Psychometrika*, 1940, 5, 17-20.
- Linn, R. L. A Monte Carlo approach to the number of factors in factor analysis. *Psychometrika*, 1968, 33, 37-71.
- Maslow, A. H. *Motivation and personality*. New York: Harper and Bros., 1964.
- MacLean, M. S., Gowan, M. S., and Gowan, J. S. A teacher selection and counseling service. *The Journal of Educational Research*, 1955, 38, 669-677.
- McGregor, D. *The human side of enterprise*. New York: McGraw-Hill, 1960.
- Ratsoy, E. W. A comparative and cross-sectional study of attitudes of prospective teachers. Unpublished doctoral dissertation, The University of Alberta, Edmonton, 1965.
- Schein, E. H. *Organizational psychology*. Englewood Cliffs, N. J.: Prentice-Hall, 1965.
- Scragg, E. S. A survey of dropouts from Alberta schools, 1963-1968. Unpublished masters thesis, The University of Alberta, Edmonton, 1968.

D. B. BLACK
and
W. E. GODING

An Experiment in Classroom Management

Fourteen graduate student instructors who were responsible for conducting class discussions after televised lectures in an introductory general psychology course were divided into two equal groups. One group participated in a series of group process workshops; the other group attended no meetings other than those normal to the operation of the course. Students in the classes of these two groups of instructors were designated as experimental and control groups, respectively. It was hypothesized that classes with the advantage of instructors adept in interpersonal communication techniques would show learning gains significantly greater than would comparable classes taught without the benefit of such techniques. No statistically significant differences were found between experimental and control groups on either academic achievement scores or generally on three affective domain scale measures of reticence, anxiety, and dogmatism. (Dr. Black is a Professor of Educational Psychology and Dr. Goding is an Associate Professor of Curriculum and Instruction in the Faculty of Education at The University of Calgary.)

Criticisms that communication is essentially a one-way process are heard frequently today. Among the youth, the demand for dialogue appears to be critical to their current quest for relevant involvement with those in power. This growing demand can be detected across institutions—home, church, government, school. In their desires for more active participation in the classroom, the young see two-way communication as essential.

Yet, for all its apparent newness, the study of communication processes has been an educational research concern for many years. One need only refer to the classic network studies of Bavelas (1950), Leavitt (1951) and Shaw (1964), or to the earlier Lewin, Lippitt and White leadership studies (1939) for evidence of such concern. Characteristically, in these particular studies and in those considering authoritarian versus democratic or pupil-oriented leader (or teacher) configurations, the criterion most frequently has been task output of some kind. While attention has been given

to the changing of attitudes (affective domain), primary emphasis has been on production (cognitive output). Today's emphasis on communication focuses on improving the quality of interpersonal relationships as a primary goal. Certainly, the task or cognitive aspect of society remains vital if that society is to be maintained. Keltner (1970) neatly sums the contemporary approach to cognitive-affective interrelationships as follows:

As we talk together, we will *make decisions* about each other; we will *solve problems* of one kind or another; and we will *anticipate future action*, either together or apart. (p.3)

Gage (1966), on this matter of the cognitive versus the affective, suggests that most of the literature research on teaching is not cognitively oriented but has been aimed at social and emotional aspects of how teachers behave and how students respond and develop. In retrospect, it is largely since the advent of programmed and computer-assisted instruction that task output has regained dominant status as a primary objective if for no other reason than that it can be empirically defined with reasonable reliability. McKeachie (1954) had earlier summarized the present research position in this way:

In short, the choice of instructor-dominated versus student-centered discussion techniques appears to depend upon one's goals. The more highly one values outcomes going beyond acquisition of knowledge, the more likely that student-centered methods will be preferred. (p. 150)

For all this, task output remains critical to the classroom—an aspect which the public and, to a lesser extent, the pupils themselves expect of our schools. Therefore, if improved dialogue can facilitate efficient acquisition of these tasks, its expanded use in the classroom is to be encouraged.

A search of the literature reveals that much of the work has been incorporated within studies having another focus. Consider the case of Smith (1966) discussing a series of in-house studies involving, among other things, the role of discussion in teaching university psychology classes:

In the first study, we were surprised to find that participants in class discussions, even when discussion was strongly encouraged, were nonconformists. They were also better informed than nonparticipants about psychology at the beginning of the course, but did not seem to benefit from their participation (Smith and Dunbar, 1951). In a second study, we were surprised to find that students did not particularly care for or benefit from classes run along democratic lines (Johnson and Smith, 1953). In a third study, we were surprised to find that whether students had favorable or unfavorable attitudes toward their psychology teacher and class activities had no relation to how much they learned during the course. Their attitudes toward the university they were attending and toward the importance of being students, however, did (Armour, 1954). In a fourth study, we were surprised to find that those who were most enthusiastic about their participation in small discussion teams learned the least from them. (p. 201)

In comparing recitation, tutorial, and discussion teaching techniques, Guetzkow, *et al.* (1954) found the autocratic recitation method produced superior performance on final examinations and a greater interest in the discipline, namely, psychology. Studies in the same series were reported

by Bovard (1951a, 1951b) and McKeachie (1951a, 1951b). Given effective responsibility for group decisions regarding content, conduct and evaluation of the course, the students spent most of the class time in decision-making discussion. Notwithstanding this inattention to course content *per se*, there was no significant difference in examination scores from those of the control groups. In a well known study, Bellack, *et al.* (1963) examined the relationship of teaching styles to the discourse of the classroom, also assessing the amount of learning that occurred. They found that the amount of learning for a topic was not related to the amount of discussion given to that topic.

Perhaps the most relevant investigation to the present concern was a pilot study reported by Flickinger, Hunt and Bradley (1967). They attempted to demonstrate the effect of permitting students to deal openly with their peers about their attitudes and feelings. They hypothesized that this would produce "marked improvement" in course performances in engineering freshman mathematics. Although the sample was small in both the experimental and control groups ($N=7$), they concluded that the performance of the experimental group was significantly better than that of the control group, but they could not confirm any improvement in motivation. The subjects were not informed of the criterion until after the study, and although they statistically did not show motivational differences, the experimental group expressed personal satisfaction with the training sessions that could only be classified as most satisfactory. Along the same line, both Lewin (1952) and Kostick (1957) report the use of group discussion to improve aspirations for better course grades.

Although concerned with the elementary school, two studies by Aspy (1967a, 1967b) are relevant to the present investigation. The purpose was to demonstrate relationships between degrees of teacher facilitative behavior and learning in a third grade class as measured by the Stanford Achievement Test. He found that students of facilitative teachers showed significant gains on four of the five subtests (no significance on the Spelling subtest). In his second study, he reported performance gains for students of high facilitative teachers far in excess of those with teachers functioning at a low facilitative level. In addition, students in the low facilitative situation showed significantly greater levels of truancy.

While these studies do not represent an exhaustive review of the literature, they do illustrate the contention that though research has been done in the area, many of the pertinent findings are incidental to studies with a different focus. The reader interested in college teaching in particular, is referred to McKeachie's excellent chapter in the *Handbook of Research on Teaching* (1963).

The Hypothesis

The main hypothesis for the study was developed on an *a priori* basis as follows. Learning research tells us that the individual learns only to the extent that he is involved in the process. While there is some argument about covertness versus overtness, learning is still an individual thing whether this be the learning of content or the changing of attitudes. Involvement takes place largely to the extent that the individual is "comfortable" with himself and with the group of which he is a member.

Learning also seems to take place best under conditions of mild stress—too much or too little is disruptive. Thus, the degree of involvement will be reflected in the degree of freedom from interpersonal anxiety and in the ability of the group to deal with content matter under discussion. For example, if one feels comfortable in the group he will not be afraid to speak out—to take risks—for fear of “making a fool of himself.” With anxiety from group interaction reduced, discussion of content should become more “open” for free learning. Although the kind of learning task is a vital factor, the research literature provides support for the idea that improved learning occurs in group situations. In general, it was hypothesized that students who have had opportunity to establish better peer relations in the learning group will achieve better as a group than will those not provided such opportunity. If one were to arrange classroom management to first establish better lines of interpersonal communication and then proceed within this rubric to content learning, the learning gains of such classes would be greater than for those not given this opportunity.

Specifically, the hypothesis struck was that those classes with the advantage of instructors adept in interpersonal communication techniques would show learning gains significantly greater than would comparable classes taught without benefit of such techniques.

Design

The sample of the study (N=303) consisted of all students registered in the 1970 Fall Term (13 weeks) of Educational Psychology 211 at the University and who “survived” to write the third assessment test on December 10. This is a freshman course introducing general psychology with an educational emphasis. It was offered on a Tuesday-Thursday sequence in 75-minute periods at 9:30 a.m. and 11:00 a.m. The general format was a televised lecture presentation of about 45 minutes followed by a discussion seminar. Course enrollment was divided originally into sixteen sections, random student assignment within the two offered times was carried out by computer sectioning in the Registrar’s Office. The principle of randomness between offered times was confined to the extent of the student’s obtaining a workable timetable. Administrative necessity reduced the number of sections to fourteen, seven in each time slot. Students in the two cancelled classes and late arrivals were randomly assigned to other sections in numbers to make each section’s size approximately equal. This resulted in section sizes of about 25 each for the seven 9:30 a.m. classes and about three less for the 11:00 a.m. classes.

Each section was assigned a graduate student instructor whose responsibility was to conduct class discussion after the TV lecture. To avoid “remoteness”, the TV lecturers visited each class throughout the course on a cycled sequence. In addition to three assessment periods in the term, there were three periods with no TV lecture which were available to the instructor and the class to do with as they wished.

Students were given a choice of formats for the first two assessments. These consisted of multiple-choice, essay or short answer item tests. The third assessment, common to all students, was a 90-item multiple-choice test with a KR 20 reliability of .82. This test was also used as an anchor

to articulate marks for the different assessment pattern choices, although with one exception, this was not necessary. Test content was based on both the TV lectures and text materials. All items were screened and approved by TV lecturers for the assessment period in question.

The study was so planned that it would not prejudice the student because of his individual involvement—or lack of it. This involved “treating” the fourteen section instructors¹ rather than the classes themselves. The participating instructors, all graduate students, were paired on the basis of teaching experience, Faculty of undergraduate degree, age, and sex. Primary emphasis was placed on the teaching experience characteristic. Six pairs resulted with three conditions of teaching experience: those without prior teaching experience, those with teaching experience in the schools (pairing here attempted to match years of teaching experience as well), and finally, those who had taught the course the previous year. This resulted in two pairs assigned to each of the three teaching conditions. For each condition pair, one pair was assigned at random to the 9:30 or 11:00 a.m. class, and one from each pair randomly to the experimental group. A further feature assigned the same classrooms to opposite experimental conditions between class times for each pair. This assignment left two sections for use as spares in the event that something happened to a pair member within the design proper. (As it turned out, such reassignment was unnecessary.) The pair assignments and number of students by section is given in Table 1.

TABLE 1

CLASS/SECTION ENROLLMENTS AS OF DECEMBER 15 AND WRITING THIRD ASSESSMENT TEST AS ASSIGNED TO CONTROL AND EXPERIMENTAL GROUPS BY TIME AND INSTRUCTOR PAIRING CONDITION

Section Instructor Condition	Pair No.	Experimental Condition				Total	
		Control Group		Experimental Group			
		Time of Class		Time of Class		Experimental Condition	
		9:30	11:00	9:30	11:00	Control	Experimental
I. No Previous Teaching Experience	1	23		22			
	2		21		20	44	42
II. Teaching Experience in Schools	3	21		24			
	4		20		26	41	50
	Spare				21		21
III. Taught Course Last Year	5	22		21		45	38
	6		23		17		
	Spare	22				22	
Total (Pairs Only)		66	64	67	63	130	130
TOTAL		85	64	67	81	152	151

¹ The authors would like to acknowledge with great appreciation the contribution of the following people, not only to this study but to the course itself: Miss Heather Bulmer, Mrs. Kathleen V. Cairns, Miss Judith A. Campbell, Miss Dana McLaren, Mr. F. Patrick Clarke, Mr. Robert D. Desjardins, Mr. Stanley A. Engel, Mr. Sheldon L. Maerov, Mr. Heinz J. Moller, Mr. Maurice Nakoneshny, Mr. Gregory J. Rudloff, Mr. Thomas A. Stott, Mr. Gary Stromsmoe, and Mr. Jack Tarasoff.

The "treatment" of the experimental group (X group) proceeded as follows. The seven X group and seven control group (C group) instructors were given adjoining offices but on opposite sides of the building with the intention of minimizing interchange between groups. It was also intended to provide new instructors easy access to experienced colleagues within each X or C group. A series of weekly two-hour group process workshops were conducted by one of the authors (Goding) to differentiate the X group from the C group. These sessions were concerned with the understanding and employment of communication techniques intended to facilitate member participation and more "open" discussion of course content in small groups. The X group discussed group process theory and procedures, participated in exercises designed to illustrate theoretical aspects, and evaluated its own efforts on a shared experience-and-advice basis. (It is interesting to note that the X group became very close, with further evidence that the C group would like to have become involved in the seminars. This was to have interesting effects as will be noted later.) For the C group, nothing was done other than through regular meetings of all instructors and lecturers normal to the overall operation of the course. All students were advised initially that a study was being conducted but they were not told the group to which their instructor had been assigned nor the form of the study.

The primary criterion of the study was each section's performance on a multiple-choice test. Two additional measures in the affective domain were employed. The first is a scale used routinely by the Faculty Speech Division to detect potential speech problems among incoming students. It consists of items from a Reticence Scale (R) and an abbreviated Taylor Manifest Anxiety Scale (TA). The R Scale is an instrument developed by C. M. Phillips at Pennsylvania State University in 1965. It is, to the knowledge of our colleagues in the Speech Division, unpublished although it has been used in a number of theses and routinely as a screening device at several institutions. Its administration here as a post-test within the last ten days of the course constituted no major problem, and the information gained would be useful to both the present study and to the Speech Division. Of the 303 students in the study sample, only 177 wrote both pre- and post-tests.

The second affective domain test employed was the Dogmatism Scale (D) developed by Rokeach (1951, 1960). It, too, was used on a pre-/post-basis, with about two and one-half months between administrations. Only a partial sampling of the study population was obtained (215 of a possible 303).

An attempt was made to do a transactional analysis of the discussions, but equipment failure problems on the first sampling data necessitated cancellation of this phase of the study. In its place, one room was selected at random from the seven used in the course, and both the 9:30 and 11:00 a.m. classes held in that room were video-taped. This procedure provided both a control and experimental section.

Results

The most dramatic effect of the impact of the communication seminars could be obtained by entering classrooms after classes had been dis-

missed. In the C group sections, chairs remained in orderly rows in the traditional sense. In the X groups, however, chairs were about the room either in a large circle or in smaller groups. The willingness of the X group instructors to try discussion-encouraging techniques was further confirmed by the lecturers on visits to the rooms. Provision was made for (in several cases requested by students) cancellation of scheduled lecturer visits for a particular day. Finally, the televised X- and C-group discussions attested to the dramatic differences in the conduct of the two classes. It is to be emphasized that each class video-taped was superbly conducted—a credit to both the instructor and the students involved. The point is that the management techniques used in the two classes discussing the same topic differed dramatically. This point will be discussed later.

Since it was assumed that students had been assigned randomly to sections, analysis of data was made directly of the sections' performance on the criterion achievement test. Results of this analysis are reported in Table 2. None of the mean differences was found to be statistically significant at the 5% level of confidence. However, the direction of differences was interesting. Overall, the C group did better than the X group, and this was true of the No Experience, and the School Teaching Experience condition groups. In each case, the variances of the X groups were larger than those of the C groups. Finally, the pattern of means for the C and X groups was directly opposite, that is, in the C groups those with No Experience instructors scored highest while in the X groups, the reverse (and expected) situation was found.

This invited the development of new hypotheses, except for the growing suspicion that perhaps student section assignments were not random.

TABLE 2
MEANS AND STANDARD DEVIATION OF TEST CRITERION
SCORES FOR CONTROL AND EXPERIMENTAL GROUPS
(Hypotheses: Mean X > C)

Section Instructor Condition	Experimental Condition	Raw Score of Test Criterion			Test of Hypothesis that mean of X > C
		N	Mean	S. D.	
I. No Previous Teaching Experience	C	44	57.93	8.92	Reject -(NSD)
	X	42	54.57	9.73	
II. Teaching Experience in Schools	C	42	56.67	7.41	Reject -(NSD)
	X	50	55.24	9.52	
III. Taught Course Last Year	C	45	55.53	8.38	Reject (NSD)
	X	38	56.11	9.88	
Total of Paired Sections	C	130	56.62	8.54	Reject -(NSD)
	X	130	55.28	9.70	
	Total	260	55.95	9.16	
Total Including Spare Sections	C	152	56.63	8.42	Reject -(NSD)
	X	151	55.25	9.65	
	Total	303	55.94	9.10	

Table 3 reports the admission qualifications of students by section. Also reported are the mean and standard deviations of the Grade XII Departmental admission averages of those students whose records included these. Two features of Table 3 should be noted. First, the admission average was higher for the C group than for the X group—significantly so at the 5% level for the No Experience instructor classes. Second, the number of non-matriculated adults (NMA) in the C group outnumbered those in the X group, 19:2. The case of the NMA student is well documented by in-house research and that reported by Vasalenak (1970). In brief, the NMA student is much less apt to fail or withdraw than is the normal incoming student. It is acknowledged, too, that they as a group are not among the very high standing students.

In light of this evidence there seemed little recourse than to do an analysis of covariance, using only those students for whom a high school admission average was available. A sample of fourteen eligible students was drawn at random from each of the twelve paired sections, and the method of analysis outlined by McNemar (1962, p.362-373) followed. It was found that there was a significant relationship between high school admission average and performance on the criterion test ($r=.48$). As reported in Table 4, when the means were adjusted, differences between C and X groups diminished markedly and the patterns of direction of differences within the C and X groups noted earlier disappeared.

TABLE 3
DISTRIBUTION OF ADMISSION QUALIFICATIONS BY CONTROL
AND EXPERIMENTAL GROUPS AND INSTRUCTOR CONDITION

Section Instructor Condition	Experiment Condition	Admission Condition										Group Grade XII Admission Averages				
		N	Grade XII Average							CEE/Early Admission*	Non-Matric Adult	Miscellaneous**	N	Mean	S.D.	Test of Hypothesis that X = C
			Below Admission Average	60-64	65-69	70-74										
I. No Previous Teaching Experience	C	44	1	5	13	8	9	2	3	3	35	70.14	6.00	Reject (5%)		
	X	42	1	19	6	4	7	1	1	3	37	66.54	6.59			
II. Teaching Experience in Schools	C	41	-	15	9	4	6	-	5	2	34	67.85	7.21	Accept (NSD)		
	X	50	-	17	17	10	3	-	-	3	47	66.74	4.78			
III. Taught Course Last Year	C	45	1	15	8	6	5	1	7	2	34	66.91	6.27	Accept (NSD)		
	X	38	-	8	8	11	1	3	1	6	28	68.09	4.98			
Total Paired	C	130	2	35	30	18	20	3	15	7	103	68.32	6.62	Accept (NSD)		
	X	130	1	44	31	25	11	4	2	12	112	67.01	5.48			
	Total	260	3	79	61	43	31	7	17	19	215	67.64	6.06			
Total Including Non-Matriculated Adults	C	152	2	40	38	22	22	4	19	8	119	68.13	6.49	Accept (NSD)		
	X	151	1	51	37	25	13	4	2	12	133	67.07	5.38			
	Total	303	3	92	75	75	35	8	21	20	252	67.57	5.96			

*Registrar's Office reports students admitted under this ruling usually have Departmental averages of 70 or higher.

**Includes transfer from community colleges (6), those with completed degrees (3), university level transfers (3), and high school admissions from other areas than Alberta or Saskatchewan.

TABLE 4

CONTROL AND CRITERION MEANS AND STANDARD DEVIATIONS OF A SAMPLE SELECTED AT RANDOM FROM STUDY POPULATION AND CRITERION MEANS CORRECTED AS A RESULT OF ANALYSIS OF COVARIANCE ($r = .46$)

Section Instructor Condition	Experimental Condition	Grade XII Departmental Admission Average			Criterion Scores: Third Assessment 90 M/C Item Test		
		N	Mean	S.D	Mean	Corrected Mean	S.D
I. No Previous Teaching Experience	C	28	70.21	6.14	58.50	56.77	8.71
	X	28	66.39	7.47	55.35	56.09	9.21
II. Teaching Experience in Schools	C	28	67.57	6.54	56.21	56.20	8.48
	X	28	66.10	4.73	55.46	56.39	8.30
III. Taught Course Last Year	C	28	66.92	6.49	56.10	56.50	5.42
	X	28	68.07	4.98	56.21	55.87	8.97
Total of Paired Sections	C	84	68.24	6.48	56.94		8.59
	X	84	66.86	5.85	55.67		8.87
	Total	168	67.55	6.21	56.30		8.78

TABLE 5

MEANS* AND STANDARD DEVIATIONS* BY CONTROL AND EXPERIMENTAL CONDITION FOR PRE- AND POST-TEST SCORES ON THE PHILLIPS RETICENCE (R), ABBREVIATED TAYLOR MANIFEST ANXIETY AND ROKEACH DOGMATISM SCALES

Section Instructor Condition	Experimental Condition	Phillips Reticence (R) Scale				Abbreviated Taylor Manifest Anxiety (TA) Scale				Rokeach Dogmatism (D) Scale			
		N	Pre-T (I)	Post-T (I)	S.D.	N	Pre-T (I)	Post-T (I)	S.D.	N	Pre-T (I)	Post-T (I)	S.D.
			M/S.D.	M/S.D.			M/S.D.	M/S.D.			M/S.D.	M/S.D.	
I. No Previous Teaching Experience	C	17	15.2/7.3	11.7/5.3	.77	17	41.9/8.4	4.7/11.7	.78	17	24.4/18.1	26.4/21.1	.76
	X	30	15.2/7.4	13.8/7.3	.65	30	41.9/8.4	6.8/12.0	.64	30	24.7/18.1	27.0/17.8	.71
II. Teaching Experience in Schools	C	24	15.9/7.8	14.4/9.1	.79	24	41.8/8.4	4.4/8.1	.77	24	24.9/18.1	24.1/22.7	.73
	X	22	14.2/8.8	13.6/7.8	.60	22	41.8/8.4	5.8/8.1	.71	22	23.7/17.1	25.4/18.0	.71
III. Taught Course Last Year	C	31	14.3/7.6	9.2/5.3	.78	31	41.8/8.4	4.6/11.8	.78	31	24.4/18.1	24.0/20.1	.84
	X	23	12.6/6.8	10.4/6.7	.57	23	41.8/8.4	4.0/4.1	.46	23	23.8/18.1	23.6/11.1	.86
Total of Paired Sections	C	72	14.4/7.6	11.1/7.1	.78	72	41.8/8.4	4.7/8.1	.78	72	24.4/18.1	24.8/22.1	.78
	X	78	14.3/7.7	12.6/7.2	.71	78	41.8/8.4	6.0/8.1	.64	78	24.4/18.1	24.1/18.1	.77
	Total	150	14.4/7.6	11.9/7.2	.75	150	41.8/8.4	5.4/8.1	.69	150	24.4/18.1	24.7/20.1	.78
Total Including Spare Sections	C	87	14.3/7.7	11.2/6.1	.80	87	41.8/8.4	4.1/8.1	.78	87	24.8/18.1	24.5/21.1	.79
	X	90	14.6/8.0	12.4/7.1	.72	90	41.8/8.4	6.1/8.1	.64	90	24.7/18.1	24.9/18.1	.84
	Total	177	14.4/7.9	11.8/6.1	.78	177	41.8/8.4	5.1/8.1	.71	177	24.8/18.1	24.7/20.1	.82

*All means and standard deviations rounded to one decimal place. All statistical tests based on two.

**All means less 100.

These data clearly reject the hypothesis that increased facilitation of discussion, with the implied associated psychological benefits, would result in higher scores on the criterion achievement test. It is also important to note that the techniques used by the X group instructors, while not producing statistically significant improvements in learning, did not act to the detriment of the students.

If the techniques of classroom management aimed at improving communication did not improve achievement, did they have any effect in the affective domain? Three measures, as noted before, were used: the Reticence Scale (R), the Abbreviated Taylor Manifest Anxiety Scale (TA), and the Rokeach Dogmatism Scale (D). The investigators were interested in the extent to which the scores had been reduced between pre- and post-testing on all three variables for each individual as well as the differences between means. The correlations for the total sample between pre- and post-testings for the R, TA, and D scales were .78, .64, and .72, respectively. The means and standard deviations for pre- and post-test scores on each scale appear in Table 5. Although they are not reported, the means and standard deviations for the differences in scores from pre- to post-testing were calculated for all three scales. Table 6 summarizes the findings from the testing of four hypotheses: the equivalence of pre-test scores between X and C groups; a "positive" change from pre- to post-test scores for all groups; post-test scores would show less anxiety, reticence, and dogmatism in the X group; and the least change in scores

TABLE 6

SUMMARY OF HYPOTHESIS TESTING USING PRE- AND POST-TEST AND DIFFERENCE SCORES FOR THE RETICENCE, ANXIETY, AND DOGMATISM SCALES BY INSTRUCTOR AND EXPERIMENTAL CONDITION

Section Instructor Condition	Experimental Condition	Reticence Scale				Anxiety Scale				Dogmatism Scale			
		Hypothesis				Hypothesis				Hypothesis			
		C ₁ =X ₁	T ₁ >T ₂	C ₂ >X ₂	X _D >C _D	C ₁ =X ₁	T ₁ >T ₂	C ₂ >X ₂	X _D >C _D	C ₁ =X ₁	T ₁ >T ₂	C ₂ >X ₂	X _D >C _D
I. No Previous Teaching Experience	C	A	A	R	R	A	R	R	R	R	R	R*	R
	X		A				R				R		
II. Teaching Experience in Schools	C	A	R	R	R	A	R	R*	R*	A	R	R	R
	X		R				R*				R		
III. Taught Course Last Year	C	A	A	R	R*	A	R	R	R	A	R	R	R
	X		R				R				R		
Total of Paired Sections	C	A	A	R	R*	A	R	R*	R	A	R	R	R
	X		A				R				R		
	T	-	A	-	-	-	R	-	-	-	R	-	-
Total Including Spare Sections	C	A	A	R	R	A	R	R*	R	A	R*	R	R
	X		A				R				R		
	T	-	A	-	-	-	R	-	-	-	R	-	-

Legend: A—Hypothesis accepted at 5% confidence level or better.
R—Hypothesis rejected.
*—Converse Hypothesis would be accepted at $p \leq .05$.

from the pre- to post-testing would occur in the C groups. The conventional "t" test was used throughout. The acceptable confidence limit for any difference found was 5%.

The results revealed that for all instructor conditions and combined conditions, with one exception, no statistically significant differences were found between pre-test means on all three scales. The exception was for the D scale and No Previous Experience group, where the X group mean score was significantly higher than that of the C group.

Differences between each student's performance on pre- and post-test scores, as well as post-test score differences between X and C groups necessitated rejection of the hypothesis that X group students, individually and collectively, would score significantly lower than would their counterparts. In every instance for the three scales employed, differences were found to be either in the wrong direction to that hypothesized or as not having statistical significance.

The failure to show no statistically significant differences between pre-test scores for the C and X groups on the D scale necessitated following the same analysis of covariance design as before, but using pre-test scores as the controlling variable and differences between pre- and post-testing scores as the criterion. Twenty-three students were selected at random for each instructor condition and the analysis conducted on this sample. In short, no statistically significant relationship was found between the pre-test and difference scores which would account for any differences found. When the corrected means were examined, only those means of the paired instructors who had taught the course the preceding year differed significantly from each other. This particular difference showed increased D scores for the X group, thereby causing the hypothesis to be rejected out of hand.

The comparison of pre- and post-test score means requires special attention. It was hypothesized that the very content of the course, regardless of X or C group treatments, should result in lower R, TA, and D scores. Only the R scale scores show much difference, and then only when the standard error of the difference between means is corrected for the correlation between the pre- and post-test scores. For this scale, even when differences were not statistically significant, all were in the hypothesized direction. For the TA and D scales, the change is a matter of progression in degrees. For the TA scale, some groups reported post-test means higher than the pre-test's, while other conditions reported the opposite. With one exception, no statistically significant differences were found between pre- and post-test score means. The one exception, the experimental Previous School Teaching Experience group, reported a significant increase in anxiety scores. The D scale results paint the opposite picture to that of the R scale. Here, post-test scores were higher than pre-test, with one exception, the experimental No Previous School Experience group. This one difference was not statistically significant.

From the above, accepting that the scales in each case measured what was claimed of them, it could be concluded that the course, Educational Psychology 211, had students who over the period of study: (a) showed no consistent change in anxiety levels, (b) who became less reticent, and (c) who became more dogmatic than when they began the course. Whether

this can be attributed exclusively to this particular course is a moot question but one worth further investigation.

Discussion

As a result of this study, a number of points should be considered. First, in the light of the contradictory evidence from the literature, a null hypothesis format would have been preferred. Second, the actual study conducted in an operational setting was subject to all the weaknesses associated therewith. For example, although there is no evidence of this, it may have been that the very size of the classes operated against the success of the experiment, i.e. the techniques used may function much better with much smaller groups. It was also very evident that the teaching styles within the experimental and control groups differed greatly. There was, for example, some evidence that some of the control group instructors wanted to and did use methods analagous to some used in the experimental group classes. It also could be that the criterion was not a valid assessment of cognitive learning in the course. The students themselves took a stance on this. Or it may be that the very concepts of interpersonal communication and task achievement are not compatible. For example, in an early study Deutsch (1949) found in contrast to a non-competitive group, the competitive group was more obstructive, aggressive and oppositional. (Like findings for groups with task-oriented goals are reported by Raven and Rietsema (1957), Bales (1958), and Della Piana and Gage (1955).) Task achievement implies competitiveness which acts against social dialogue.

Finally, one area of evaluation has been purposely neglected, the reactions of the students themselves. This was done for two reasons: First, feedback from the students via the instructors had been encouraged throughout the course. This was very direct. Therefore, any collection of such data would represent a distorted picture of the individual's attitude because of previous class discussions. Finally, the resistance to completion of forms not directly related to course content at the end of the course would ensure a completion ratio somewhat less than satisfactory. In its place, a debriefing of the course was held by Dr. W. R. Unruh, Head of the division of the Department responsible for the course. Students in each class elected one representative to meet with him. Two such group meetings were held, one with representatives from the control group; the other, from the experimental sections. Each was asked the same questions and discussions proceeded about each. It is not possible to meaningfully compare the two groups but the following reactions were brought forcibly home to the authors upon reviewing the tapes:

- (1) the students of both groups were not hesitant to openly and bluntly criticize all aspects of the course, nor did they fail to offer many excellent suggestions on how the course might be improved;
- (2) they were not uniformly enthused, to say the least, about TV teaching, the lecture content and some of the TV lectures and lecturers, in particular (See McKeachie, 1963, p. 1149, citing Lepere and Wilson, 1958; and Macomber and Siegel, 1960);

- (3) they did speak with favor about the opportunity to discuss the topics and, within the context of the preceding point, asked for more and better discussion time and with a greater "provided content" basis;
- (4) they were concerned with the format of the assessments throughout the term claiming that they did not truly assess the amount of learning in that period and particularly that of growth from the discussion; and finally,
- (5) they were inconsistent within each group as to whether the aims and the objectives of the course had been made clear.

The general impression of the authors regarding the two groups was one of varying degrees of hostility (bluntness?) with the control group being clearly the most direct. Whether this was a result of the experimental conditions or simply the result of the classes' selection techniques in naming their representatives cannot be adequately answered.

In conclusion, for those hesitant to 'humanize' their classrooms for fear of losing quantitative gains, such concerns appear without basis in fact. Smith (1966) puts it this way, "Where sensitivity is viewed as the primary goal, student satisfaction and mastery of psychological knowledge can at least be as great as where satisfaction and mastery of inert ideas are viewed as primary goals (p. 203)." As Krathwohl, *et al.*, remark, mastery of content may be one thing but in the process of acquiring this content, aversion to a subject, e.g., literary works, may also occur (1964, p. 20). It remains that what a teacher does in the classroom should relate closely to his or her objectives. This study and the literature in general about classroom management and actual achievement suggest that indeed there is considerable latitude open to the teacher/instructor before significant learning losses become apparent.

References

- Aspy, D. "The differential effects of high and low functioning teachers upon achievement," and "The effects of high and low functioning teachers upon student performance." Unpublished, University of Florida. As cited by P. R. Carkhuff and B. G. Bereson, *Beyond counselling and therapy*. New York: Holt, Rinehart and Winston, 1967, pp. 296-297.
- Bales, R. F. Task roles and social roles in problem solving groups. In E. MacCory, *et al.* (Eds.), *Readings in social psychology, Third Edition*. New York: Holt, Rinehart, and Winston, 1958, pp. 437-447.
- Bavelas, A. Communication patterns in task-oriented groups. *Journal of the Acoustical Society of America*, 1950, 22, 735-730.
- Bellack, A. A., Danitz, J. R., *et al.*, *The language of the classroom: meanings communicated in high school teaching*, U.S. Department of Health, Education and Welfare, Office of Education. Cooperative Research Project No. 1487. New York: Institute of Psychological Research, Teachers College, Columbia University, 1963.
- Bovard, E. W., Jr. The experimental production of interpersonal affect. *Journal of Abnormal Social Psychology*, 1951, 46, 521-528.
- Bovard, E. W., Jr. The psychology of classroom interaction. *Journal of Educational Research*, 1951, 45, 215-224.

- Della Piana, G. M., & Gage, N. L. Pupil's values and the validity of the Minnesota Teachers Attitude Inventory. *Journal of Educational Psychology*, 1955, 46, 167-78.
- Deutsch, M. An experimental study of the effects of cooperation and competition upon group process. *Human Relations*, 1949, 2, 129-152.
- Flickinger, C., Hunt, P., & Bradley, H. Some effects of human relations training on performance of freshmen engineering students in a beginning math course. Unpublished paper presented to Seminar in Group Process, Spring Quarter, University of Denver, 1967.
- Gage, N. L. Research on cognitive aspects of teaching in *Report on the seminar on teaching: The way teaching is*. Washington: Association for Supervision and Curriculum Development and the Center for the Study of Instruction, National Education Association. 1966, pp. 29-44.
- Guetzkow, H., Keely, E. L., & McKeachie, W. J. An experimental comparison of recitation, discussion, and tutorial methods in college teaching. *Journal of Educational Psychology*, 1954, 45, 193-207.
- Johnson, R. L., & Smith, H. C. Democratic leadership in the college classroom. *Psychological Monographs*. 1953, 62(11).
- Krathwohl, D. R., Bloom, B. S., & Masia, B. B. *Taxonomy of educational objectives: The classification of educational goals, Handbook II: Affective domain*. New York: David McKay Co., 1964.
- Keltner, J. W. *Interpersonal speech-communication: Elements and structures*. Belmont, California: Wadsworth Publishing Company, 1970.
- Kostick, M. M. An experiment in group decision. *Journal of Teacher Education*, 1957, 8, 67-72.
- Leavitt, H. J. Some effects of certain communication patterns on group performance. *Journal of Abnormal and Social Psychology*, 1951, 46, 38-50.
- Lewin, K. Group decision and social change. In *Readings in social psychology*, G. E. Swanson, et al. (Eds.), New York: Henry Holt, 1952, pp. 330-334.
- Lewin, K., Lippit, R., & White, R. K. Patterns of aggressive behavior in experimentally created social climates. *Journal of Social Psychology*, 1939, 10, 271-99.
- McKeachie, W. J. A program for training teachers of psychology. *American Psychologist*, 1951, 6, 119-121.
- McKeachie, W. J. Anxiety in the college classroom. *Journal of Educational Research*, 1951, 45, 153-160.
- McKeachie, W. J. Student-centered vs. instructor-centered instruction. *Journal of Educational Psychology*, 1954, 29, 143-150.
- McKeachie, W. J. Students, groups, and teaching methods. *The American Psychologist*, 1958, 13, 580-584.
- McKeachie, W. J. Research in teaching at the college and university. In *Handbook of research in teaching*, N. L. Gage, (Ed.), Boston: Rand McNally & Co., 1963, pp. 1118-1172.
- McNemar, Q. *Psychological statistics, Third Edition*, New York: John Wiley and Sons, 1962.
- Raven, B. N., & Rietsema, J. The effects of varied clarity of group goal and group path upon the individual and his relation to his group. *Human Relations*, 1957, 10, 29-45.
- Rokeach, M. A method for studying individual differences in "Narrow-Mindedness", *Journal of Personality*, 1951, 20, 219-223. (See also, *The open and closed mind*, New York: Basic Books, Inc., 1960.)

- Shaw, M. E. Communication networks. In L. Berkowitz, (Ed.), *Advances in experimental social psychology, Vol. I*. New York: Academic Press, 1964, pp. 111-147.
- Smith, H. C. *Sensitivity to people*. New York: McGraw-Hill Book Co., 1966.
- Vaselenak, M. Admission of mature non-matriculated students into a degree program. *McGill Journal of Education*, (Spring, 1970), 85-96.

E. A. BLOWERS

Barriers to the Education of Children From Low Income Families

Opinions about why children from low income families frequently achieve poorly in school were investigated with samples of principals, teachers, and economically disadvantaged parents. Ten problem areas were examined, and the opinions of the three groups were compared statistically. Areas of disagreement between parent and school groups included difficulty perceived in purchasing school clothing and paying school costs. There was evidence that the parent sample did not realize the effect of their children's preschool and extracurricular experiences on the educational process. The differences of opinion in several problem areas indicate a need for more effective communication between teachers and economically disadvantaged parents. (Mrs. Blowers is a Sessional Instructor in the Department of Educational Psychology at The University of Alberta.)

Problem

While a great deal is known about the school achievement of economically disadvantaged children, there is little information on how disadvantaged parents perceive the school system. One of the few facts that appears clear is that low income parents would like to have their children complete high school and university, but surveys of parent opinion (Alberta, Executive Council, vols. 3 and 4, 1967; Mulligan, 1951) contain no information on the factors which parents see as working against the effective education of their children. The perceptions of school personnel of causes for low school achievement by children from low income homes seldom is examined.

This study was an investigation of the opinions of economically disadvantaged parents and school personnel concerning reasons why children of low income families achieve poorly in school. It also examined the areas in which the groups, composed of parents on welfare, teachers and school principals, disagree.

Method

Thirty families who received social assistance through the Edmonton City Social Service Department and who lived in districts throughout the city were interviewed. The sample of school administrators consisted of the principals of thirty of the schools attended by children of the parent sample. Thirty teachers were selected randomly from those serving in schools in the two census tracts identified as having the most problems generally associated with areas of low socio-economic status (Alberta Executive Council, vol. 2, 1967).

In a structured personal interview, each informant was asked if he considered the following conditions limited the educational opportunities of children of low income families. When a respondent indicated that he considered a particular condition constituted a problem, he was asked why that condition occurred and what might be done to alleviate it. The conditions were:

- 1. lack of parental interest in education;
- 2. lack of student interest in education;
- 3. inability of parents to provide suitable school clothing for children;
- 4. inability of parents to pay school costs promptly and without undue hardship;
- 5. ineffectiveness of teaching methods used;
- 6. unsuitability of school programs;
- 7. lack of parental information on aims and functions of the school;
- 8. lack of opportunity for students to cultivate special interests and talents;
- 9. difficulty in social acceptance of economically disadvantaged students by other students;
- 10. lack of preschool experiences useful as a basis for early school learning.

Results

Table 1 gives the number of subjects in each group who considered each of the above conditions as detrimental to the education of disadvantaged children.

TABLE 1
TOTAL NUMBER IN EACH GROUP PERCEIVING EACH AREA AS A PROBLEM

Problem Area	Parents (N = 30)	Principals (N = 30)	Teachers (N = 30)
1. Parental Interest	12	17	23
2. Student Interest	20	20	15
3. Clothing	27	13	13
4. School Costs	28	16	15
5. Teaching Methods	13	10	9
6. School Programs	8	10	17
7. Parental Information	14	21	26
8. Extracurricular Interests	14	25	23
9. Social Acceptance	11	15	9
10. Preschool Experience	6	24	22

As the data permit rank ordering only, the chi square nonparametric statistic was used. Table 2 indicates the significance of the difference of perception of each group in relation to each of the other two groups.

TABLE 2
LEVEL OF SIGNIFICANCE OF DISAGREEMENT BETWEEN GROUPS AS TO
PRESENCE OF PROBLEMS IN EACH AREA ON CHI SQUARE TEST

Problem Area	Parent-Principal	Parent-Teacher	Principal-Teacher
1. Parental Interest	.20	.01	.20
2. Student Interest	1.00	.20	.20
3. Clothing	.001	.001	1.00
4. School Costs	.001	.001	.80
5. Teaching Methods	.50	.30	.70
6. School Programs	.70	.02	.10
7. Parental Information	.10	.01	.70
8. Extracurricular Interests	.01	.02	.70
9. Social Acceptance	.30	.70	.20
10. Preschool Experience	.001	.001	.70

Note—P is equal to or less than level indicated; df = 1.

It appears from this study that there are differences of perception among parents, principals, and teachers as to school problems of children of low income families. Parents and teachers differed in their perception of parental interest in education; this difference was statistically significant at the .01 level. Teachers in this sample perceived low income parents to be much less interested in their children's education than parents considered themselves to be. The reason most frequently given by school personnel for parental lack of interest was that low income parents were unable to understand the value of education for their children. The main reason given by parents was that long range educational plans were unrealistic, for students had to find full time employment as soon as possible.

Fewer teachers and principals than parents considered provision of school clothing as a problem. The difference in opinion was statistically significant at the .001 level. It appears that a majority of school personnel in this sample did not appreciate the difficulty for low income parents in making their children reasonably presentable for school.

Teachers and principals differed from parents on perceptions of the difficulty of paying school costs, which included textbook rentals and purchases, school supplies and miscellaneous fees. The difference in perception of this problem was significant at the .001 level. Nearly all families interviewed considered the payment of school costs to be extremely burdensome. Most parents said that teachers were understanding if told the money would be sent to school as soon as possible. Some parents reported retaliatory measures for late payment, including public scolding of children and exclusion from class until payments were made.

Differences in perception of the suitability of teaching methods were not statistically significant.

Teachers found more to criticize in school programs than did parents and principals, with the parent group showing least disapproval. Teachers and parents differed at the .02 level of significance on their perception of the suitability of school programs for economically disadvantaged children. Teachers were highly critical of the middle class bias of textbooks and other teaching materials and expressed a desire for materials which reflected the experiences of children from lower income neighbourhoods. Teachers and principals differed at the .01 level of significance in their perceptions of program suitability.

Parents generally considered themselves better informed on school affairs than they were thought to be by teachers and principals. These differences in attitudes were significant at the .01 and .10 levels respectively. School personnel perceived this lack of information generally as a function of parent disinterest, while parents tended to stress the difficulty of getting to school meetings, lack of communication from the school and inability to hire baby sitters.

Parents tended to consider their children's extracurricular interests more adequately developed than did principals or teachers. Parent-principal and parent-teacher opinions on this differed respectively at the .01 and .02 levels of significance.

There were no statistically significant differences of opinion between parents and school personnel on the question of social acceptance of students from low income families. Parents felt that appropriate clothing was most important in the acceptance of their children, while school personnel considered personal hygiene and social skills to be equally important.

Only six parents considered that the children of low income families start school at a disadvantage because of preschool experiences different to those of the children of more affluent families. The difference in perception between parents and school personnel on the need for special preschool programs for children of low income families was statistically significant at the .001 level.

Discussion

It is not possible to ascertain objectively the validity of the views expressed by the groups in this type of study. However, an examination of the areas showing statistically significant differences in perceptions of the groups seems appropriate. Parents considered themselves as more interested in their children's education than they were thought to be by teachers. The major reason parents gave for lack of interest in long-range educational goals by themselves and their children was the urgent need to augment family income at the earliest opportunity. In accordance with this view, parents felt that the purchase of school clothing and payment of school costs to be extremely burdensome, while school personnel tended to consider such expenses negligible. It seems safe to say that the school personnel sample generally did not realize that school

related expenses are extremely high for families with very limited incomes. Scholarships, bursaries, loans, the integration of classes with part-time employment and the reduction of costs to parents as much as is possible are some of the ways in which the financial burden of education might be lessened.

Teachers felt that parents were poorly informed on the aims and functions of the school. This perceived lack of parental knowledge of school activities may be accurate and may explain why parents were more content than teachers with their children's school programs. However, principals also tended to be less critical than teachers of programs, which may indicate a lack of communication between teachers and principals.

The adaptation of materials for children living in low income neighbourhoods, to maximize the learning potential of such materials, might best be done by school board curricula staff and/or the classroom teachers concerned.

Teachers and principals felt that the lack of resources to develop the extracurricular interests of disadvantaged children was detrimental to their education. Parents did not agree, perhaps because they did not realize the extent of services available to more advantaged children. As the talents of these children apparently are identified by the school rather than the home, the school might be the more appropriate agency to oversee their development.

The parents in this sample did not recognize the well-established finding that children from impoverished backgrounds start grade one at a disadvantage. Presently, local school boards are becoming more concerned in overcoming environmental deficits by providing appropriate pre-school experiences. A public relations program may be necessary to ensure maximum co-operation of parents.

Finally, the areas of disagreement shown by this study were more numerous and the differences in perceptions more pronounced than had been anticipated. There seems to be a serious lack of communication between the parent and school groups. It would seem to be the responsibility of school personnel to establish communication with low income parents so that parents, teachers and principals can work together to understand and, where possible, alleviate some of the problems delineated here.

References

- Alberta, Executive Council. Community Opportunity Assessment, vol. 2, *The Edmonton study*. Edmonton: Human Resources Research and Development, 1967.
- Alberta, Executive Council. Community Opportunity Assessment, vol. 3, *The Calgary study*. Edmonton: Human Resources Research and Development, 1967.
- Alberta, Executive Council. Community Opportunity Assessment, vol. 4, *Metis of the Lac la Biche area*. Edmonton: Human Resources Research and Development, 1967.
- Mulligan, R. Socio-economic background and college enrollment. *American Sociological Review*, April, 1951. p. 196.

D. A. DAWSON

Educational Quality Indices

Two educational quality indices, a "product" and a "process" index, were constructed for Ontario secondary schools. The "product" measure was based on scores achieved in tests administered to students in grades 9, 10, 11, and 12. Nine input measures such as teacher/student ratio and teaching experience were used to develop the "process" quality index. These two indices were found to be uncorrelated. The finding of non-comparability of "product" and "process" educational quality indices reported in previous studies was therefore substantiated. Researchers who desire to use an educational quality index in future might be well advised to use a "product" measure for a number of reasons. (Dr. Dawson is an Assistant Professor in the Department of Economics at McMaster University in Hamilton, Ontario.)

The analysis of educational quality has had a long history beginning with the preliminary work of Ayres (1909) and Cooke (1910) at the turn of the century. Some quality measures have been developed for use in studies concerning the "cost-quality nexus." These studies have analysed the direct relationship between increases in quality of education and cost per student. Quality measures have also been developed to compare school systems and to provide weighted measures of school output for use in studies of economies of scale.

In general, there are two basic types of quality measures: objective measures and subjective measures. The former, in turn can be approached from the "product" point of view or the "process" point of view. It is the aim of this paper to (a) describe briefly the types of measures, (b) report on an attempt to construct two measures for which data were available and (c) comment upon the comparability of the measures.

Objective Quality Measures

A "product" objective measure typically measures quality by the level of student attainment on various types of achievement tests. Many problems arise with the use of this type of measure. First, the goals of different

communities or systems may differ, and no one test or set of tests can cover the objectives of all the communities and systems at once. Second, "tests cannot and do not cover *all* aspects of learning that are worthwhile in . . . subject areas (Kershaw & McKean, 1959, p. 10)." Third, performance depends to a large but unmeasured extent upon the pupil's socioeconomic background. Finally, the results of such tests depend upon the individual's "frame of mind, his motivation, his health, and many other chance factors and not merely on the extent of his learning (Kershaw & McKean, 1959, p. 11)."

Probably the most widely known "product" measure is that which was constructed by the Quality Measurement Project of the New York State Education Department. This project tested 70,000 students in 100 school systems over a four-year period (Firman, 1963, p. 102). The testing instruments used were the Iowa Tests of Basic Skills or the Iowa Tests of Educational Development. Another more recent study was that carried out using "Project TALENT" data in 206 high schools (Thomas, 1962).

Because of the cost of sampling and measurement problems involved in "product" measures, most researchers have exhibited a preference for "process" measures. The process measures have typically focused on (a) the *quality* of inputs or (b) the *adaptability* of school systems. Examples of variables which have been put forward as good quality of input measures are (a) teacher/student ratio; (b) teacher turnover; (c) teacher experience; and (d) teacher education.

The best known measure of adaptability is "The Growing Edge" (Mort, Vincent & Newell, 1946). This device measures the degree to which schools have changed their teaching techniques and curricula in recognition of new knowledge from the fields of psychology and/or education research. Unfortunately, this type of index is very expensive to create, and accordingly an attempt was not made to construct one for the present study.

Subjective Quality Measures

As their name implies, subjective measures are not easily developed. Assessors must go into each school in the test area and give ratings on such measures as "Discovery and Development of Special Aptitudes," "Development of Gross Behaviour Patterns," and the "Amount of Consideration of the Individual." It is very difficult to obtain consistent estimates of these measures unless one person does all the assessing. Further, the employment of the teams of researchers needed for the development of this type of measure over a broad area would prove to be very costly. Owing to these problems an attempt to construct a subjective quality measure has not been made.

Construction of Quality Indices

An attempt has been made to construct cross section quality indices. Individuals have constructed these indices to measure differentials in the quality of such diverse items as mental patient care, farm housing, religious work in diocese, and the agricultural value of soils. In the field of education, initial efforts to quantify state quality differentials in the

United States were made in the 1920's (Ayres, 1920; Phillips, 1925). More recent work in this area is exemplified by the educational index developed by Hirsch (1960).

When constructing indices of this type three basic methods can be adopted. In Method I all observations for each variable to be included in the index are ranked. The ranks obtained by each school (in this case) for each variable are then summed and divided by the number of variables in the index. In Method II the value of each observation of a variable is divided by the mean of that variable to get a "corrected" observation. To get each school's index, the "corrected" observation for each variable is summed and the total is divided by the number of variables in the index. In Method III each observation is standardized by first subtracting from it the mean of sample of which it is a part and then dividing by the standard deviation of this sample. The observations are summed in the same manner as described in Method II.

In algebraic terms:

$$\text{Method I index} = \frac{\sum_{i=1}^N X_i}{N}$$

where X_i = rank in variable
 N = number of variables

$$\text{Method II index} = \frac{\sum_{i=1}^N \frac{X_i}{U_i}}{N} \quad \text{and}$$

$$\text{Method III index} = \frac{\sum_{i=1}^N Z_i}{N}$$

where X_i = value of a given observation of variable i
 U = mean of all observations for variable i
 N = number of variables
 σ = standard deviation of observations for a given variable
 $Z_i = \frac{X_i - U_i}{\sigma}$

McMillan (1946) compared the results obtained using these three methods to calculate Farm Housing Indices and found the indices to be highly correlated. He pointed out that although the first two indices were simple to construct there was a problem, particularly with Method II, in that those items which possessed greater variability received larger weights. Method III eliminated this weakness through dividing by the standard deviation; for this reason it was used in the construction of the following quality indices.

The "product" quality measure, Index A, was based upon scores achieved in tests administered by the Carnegie Foundation to students registered in Grade 9 in all sectors of the Ontario Secondary School

System in 1959; 90,719 students initially wrote the CAAT, CEAT and CMAT. The following year the same students (minus “drop-outs”) wrote the CTGF, CATF, CATE, and CATM. In Grade 11 they wrote the CPTO and CGT, and in Grade 12 the remainder of the tests were written. These tests are fully titled in Table 1.

TABLE 1
TITLES OF TESTS OF CARNEGIE STUDY

1. Canadian Academic Aptitude Tests (CAAT)
(a) CAAT I —Verbal Reasoning
(b) CAAT II —Mathematical Reasoning
(c) CAAT III —Non-Verbal Reasoning
2. Canadian English Achievement Tests (CEAT)
(a) CEAT I —Reading Achievement
(b) CEAT II —Mechanics of Expression
(c) CEAT III —Effectiveness of Expression
3. Canadian Mathematics Achievement Tests (CMAT)
(a) CMAT I —Arithmetic Computation
(b) CMAT II —Facts, Terms and Concepts
(c) CMAT III —Measurement
4. Canadian Test of General Information (CTGI)
5. Canadian Achievement Test in French (CATF)
6. Canadian Achievement Test in English (CATE)
7. Canadian Achievement Test in Mathematics (CATM)
8. Canadian Physics Test (Ontario Edition) (CPTO)
9. Canadian Geometry Test (Ontario Edition) (CGTO)
10. Scholastic Aptitude Test—Verbal I
11. Scholastic Aptitude Test—Verbal II
12. Scholastic Aptitude Test—Verbal Total
13. Scholastic Aptitude Test—Mathematics
14. Achievement Test in French
15. Test in English Structure and Usage

Rather than measuring quality by absolute scores, Index A was constructed from changes in average score in tests which measured the same abilities. Changes in scores were utilized to avoid some of the bias which could have been introduced by variation in socio-cultural background. The tests which were paired are indicated in Table 2 (e.g., X_1 is the change in average scores achieved in the Canadian Academic Aptitude Verbal Reasoning test and the Scholastic Aptitude Verbal Test).

Thus, to obtain a school's quality rating using Index A, the standardized value of the change in the average mark obtained by students in the school in each of the paired tests were compiled. Then these values were summed and divided by the number of paired tests (i.e., Method III was used). To avoid problems involving student movement between schools, only the scores of those students remaining in one school throughout the entire four year testing period were taken into consideration when evaluating a school's performance.

TABLE 2
TESTS PAIRED FOR USE IN OUTPUT QUALITY INDEX

Tests	Tests																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
CAAT I	1																				
CAAT II	2																				
CAAT III	3																				
CEAT I	4																				
CEAT II	5																				
CEAT III	6																				
CMAT I	7																				
CMAT II	8																				
CMAT III	9																				
CTGI	10																				
CATF	11																				
CATE	12				$X_7 X_9 X_{10}$																
CATM	13	X_3					$X_{11} X_{15} X_{19}$														
CPTO	14	X_4					$X_{12} X_{16} X_{20}$														
CGTO	15	X_5					$X_{13} X_{17} X_{21}$							X_{26}							
SCHaptTest VerbI	16																				
SCHaptTest Verb II	17																				
SCHapt Test Verb Tot	18	X_1		X_8								X_{24}									
SCHaptTest Math	19	X_6					$X_{14} X_{18} X_{22}$						$X_{27} X_{28} X_{29}$								
Eng TESU	20	X_2										X_{25}				X_{30}					
Fr ATF	21										X_{23}										

A positive correlation was expected between the pairings, i.e., the students in a “good” school should have shown a consistent improvement. However, the matrix of correlations shown in Table 3 indicates that variables 7, 9, 27, 28, 29 and 30 failed to yield a general positive correlation; there was no simple explanation for this fact. Three of those pairings were in Mathematics and Science and three in English so the cause of the perverse behavior did not lie in any one subject area. However, despite the lack of an explanation for the negative values, it was apparent that something had to be done about these six pairings and the method adopted was simply to delete these variables. Thus, the construction of Index A was based on the remaining 24 variables so that a positively signed homogeneity could be preserved.

The “process” quality index, Index B, was constructed from the input rather than the adaptability point of view. There were many likely

TABLE 3 CORREL

	1	2	3	4	5	6	7	8	9	10	11	12	13
1													
2	.88												
3	.16	.20											
4	.73	.66	.41										
5	.58	.46	.55	.69									
6	.59	.61	.12	.41	.33								
7	-.54	-.34	-.08	-.50	-.39	-.09							
8	.77	.71	.12	.52	.44	.68	-.01						
9	-.59	-.39	-.11	-.54	-.42	-.11	-.96	-.03					
10	.07	.12	-.04	-.02	-.08	-.14	.55	.28	.46				
11	.12	.15	.94	.35	.51	.06	.10	.24	.09	.16			
12	.68	.57	.35	.92	.63	.29	-.32	.62	-.33	.23	.42		
13	.52	.38	.44	.59	.87	.20	-.14	.58	-.14	.28	.56	.73	
14	.33	.28	.01	.15	.15	.58	.36	.76	.41	.41	.23	.39	.47
15	.13	.20	.92	.34	.49	.08	.15	.25	.13	.21	.98	.40	.53
16	.67	.59	.35	.91	.61	.29	-.26	.61	-.28	.30	.41	.98	.70
17	.51	.41	.44	.57	.84	.19	-.07	.58	-.08	.36	.56	.70	.98
18	.30	.30	-.00	.11	.10	.55	.45	.73	.49	.51	.20	.32	.40
19	.07	.13	.95	.32	.48	.06	.13	.17	.12	.14	.98	.36	.50
20	.70	.62	.37	.95	.65	.32	-.34	.61	-.36	.21	.41	.98	.69
21	.54	.42	.48	.62	.91	.23	-.17	.56	-.18	.24	.56	.71	.98
22	.31	.34	.02	.14	.13	.66	.41	.74	.45	.38	.19	.31	.36
23	.24	.24	.31	.47	.48	.45	.06	.42	.10	-.11	.32	.44	.42
24	.93	.75	.13	.72	.59	.51	-.67	.74	-.65	-.10	.11	.69	.55
25	.78	.82	.16	.61	.47	.63	-.45	.76	-.39	-.21	.16	.57	.42
26	.43	.25	-.53	.24	.38	.27	-.31	.35	-.31	-.03	-.51	.25	.39
27	.08	.01	-.90	-.24	-.40	.30	.03	.16	.06	.03	-.88	-.24	-.34
28	-.49	-.42	-.39	-.89	-.58	.06	.48	-.22	.52	-.06	-.36	-.85	-.53
29	-.33	-.22	-.54	-.55	-.89	.13	.37	-.13	.40	.01	-.52	-.53	-.81
30	-.79	-.44	-.06	-.60	-.50	-.17	.71	-.43	.75	-.05	-.02	-.59	-.49

X ₁	=	Variable 18	minus	Variable 1	X ₁₁	=	Variable 13	minus	Variable
X ₂	=	"	"	"	X ₁₂	=	"	"	"
X ₃	=	"	"	"	X ₁₃	=	"	"	"
X ₄	=	"	"	"	X ₁₄	=	"	"	"
X ₅	=	"	"	"	X ₁₅	=	"	"	"
X ₆	=	"	"	"	X ₁₆	=	"	"	"
X ₇	=	"	"	"	X ₁₇	=	"	"	"
X ₈	=	"	"	"	X ₁₈	=	"	"	"
X ₉	=	"	"	"	X ₁₉	=	"	"	"
X ₁₀	=	"	"	"	X ₂₀	=	"	"	"

RED TESTS

18	19	20	21	22	23	24	25	26	27	28	29	30
----	----	----	----	----	----	----	----	----	----	----	----	----

.18												
.30	.37											
.37	.53	.71										
.95	.20	.32	.36									
.38	.33	.46	.45	.41								
.25	.05	.69	.55	.27	.25							
.34	.12	.58	.43	.41	.36	.85						
.16	-.56	.24	.37	.16	-.07	.47	.30					
.25	-.88	-.24	-.37	.26	-.09	-.07	-.08	.62				
.17	-.33	-.87	-.55	.18	-.28	-.51	-.35	-.11	.43			
.17	-.49	-.54	-.89	.19	-.29	-.37	-.21	-.25	.58	.66		
-.19	.04	-.58	-.48	.03	.72	-.82	-.40	-.47	-.03	.54	.43	

	Variable 15	minus	Variable 9	
2	= "	19	" "	9
3	= "	21	" "	11
4	= "	18	" "	12
5	= "	20	" "	12
6	= "	15	" "	13
7	= "	19	" "	13
8	= "	19	" "	14
9	= "	19	" "	15
0	= "	20	" "	16

measures from which a “process” quality index could have been constructed. However, because of data problems, only nine measures were considered for inclusion into a composite index.

The measures were as follows: (a) teacher/student ratio; (b) teacher turnover; (c) average number of teachers with an M.A. degree; (d) average number of fully qualified teachers (teachers not teaching with a temporary certificate or letter of permission); (e) average number of teachers with a B.A. degree; (f) average number of basic certificates per teacher; (g) average number of specialist certificates per teacher; (h) average number of teachers with 5 or more years’ experience; (i) average number of teachers with 2 or more years’ experience. The data for number of teachers were compiled from the 1964 Report of the Minister of Education, and the remaining figures were taken from the 1964 “Blue Book” (Government of Ontario, 1964).

A matrix of simple correlations between the measures is shown in Table 4. These results indicate that all measures were positively correlated except for Variable (a) (teacher/student ratio) and seven of the remaining eight variables. In these cases the correlations were negative. This result was surprising but, since teacher/student ratio is also a proxy for class size, it would seem to lend some credence to the poor rating given this latter variable by a number of authors. Burkhead (1967), in particular, feels that class size varies too greatly between subject areas and grade levels to be a good quality measure.

Raymond (1968) also found the teacher/student ratio to be insignificant. He postulated that high ratios may have been due to under-utilization of teachers in rural areas and the ratio might then, in turn, have been a proxy for an inadequately organized school system and could therefore have been associated with poor quality.

The general positive correlation between the remaining variables indicated that they might all have been considered measures of the same

TABLE 4
CORRELATION OF MEASURES

Measures	Measures								
	a	b	c	d	e	f	g	h	i
a	1.0								
b	-0.121	1.0							
c	-0.023	0.021	1.0						
d	-0.063	0.149	0.426	1.0					
e	-0.127	0.020	0.473	0.458	1.0				
f	-0.103	0.275	0.338	0.530	0.312	1.0			
g	0.139	0.086	0.128	0.229	0.125	0.337	1.0		
h	-0.171	0.145	0.278	0.399	0.309	0.460	0.495	1.0	
i	-0.172	0.232	0.297	0.400	0.278	0.467	0.367	0.699	1.0

Note—Critical values: 95% = 0.164, 99% = 0.230.

thing (quality). Accordingly, Index B was constructed using Method III on those eight variables.

Given the rationale behind their construction it was expected that Index A and Index B would be positively and significantly correlated. However, an analysis of 303 paired observations yielded an insignificant correlation of $-.02$ between them.

An attempt was made to make the indices more comparable by means of factor analysis. Specifically, each component of a factor (i.e., each variable in the relevant quality index) was weighted by its factor loading which was arrived at by the "Varimax" method. (The "Varimax" method merely normalizes the results of the "Principal Axis" method.) The loadings are the correlation coefficients between the index components and the factors. New quality indices were constructed using the weights and these new indices were then compared. This analysis was simplified by the fact that when a factor analysis using both the "Principal Axis" and "Varimax" methods was carried out on Index B, only one factor was significant. On the other hand, Index A yielded five factors (A, B, C, D, and E). The correlations between the weighted indices are shown in Table 5. Unfortunately, none of the weighting schemes made the indices more comparable.

TABLE 5
CORRELATION OF "FACTOR LOADED" QUALITY INDICES

	Index B
Index A (A)	.05
Index A (B)	.03
Index A (C)	.017
Index A (D)	.0025
Index A (E)	.01

Note—Index A (A) is the new Index A arrived at by using the loadings in Factor A.

Conclusion

The problem of non-comparability is not specific to this data set. Similar results have also been arrived at using Iowa and West Virginia data (Cohn, 1968; Raymond, 1968). The question therefore arises as to which type of index is better suited for analytical purposes. Although an unequivocal claim for superiority can be made for neither it seems intuitively clear that "product" is the better measure. Despite the drawbacks mentioned above the "product" measure has one major advantage—it is a *direct* measure of quality. "Process" measures are *indirect* measures and as a result any quality index constructed by this method must be treated with less confidence than the "product" measure.

It should be noted that one recent study by Katzman (1968) has also implicitly supported product measures in that it found that no inputs had consistent effects on all the outputs considered; thereby the result derogated input surrogates for school "quality."

References

- Ayres, L. P. *Laggards in our schools*. New York: Russel Sage Foundation, 1909.
- Ayres, L. P. *An index number of state school systems*. New York: Russell Sage Foundation, 1920.
- Burkhead, J. *Input and output in large city schools*. Syracuse: Syracuse University Press, 1967.
- Cohn, E. Economics of scale in Iowa high school operations. *The Journal of Human Resources*, 1968, 3, 422-434.
- Cooke, M. E. *Academic and industrial efficiency*. New York: The Carnegie Foundation for the Advancement of Teaching, 1910.
- Firman, W. D. The relationship of cost to quality in education. *Long range planning in school finance*, based on Proceedings of the Sixth National School Finance Conference, St. Louis, 1963.
- Government of Ontario, Department of Education. *Schools and teachers in the Province of Ontario—Secondary Schools, Teachers' Colleges and Technical Institutes, 1964*. Toronto: Queen's Printer, 1964.
- Hirsch, W. Z. Determinants of public education expenditures. *National Tax Journal*, 1960, 13, 29-40.
- Katzman, M. T. Distribution and production in a big city elementary school system. *Yale Economic Essays*, 1968, 8, 201-256.
- Kershaw, J. A., & McKean, R. N. *Systems analysis and education*. Santa Monica: RAND Corporation Research Memorandum RM-2473-FF, 1959.
- McMillan, R. T. Comparison of farm housing indices from Oklahoma. *Social Forces*, 1945-46, 174-180.
- Mort, P. R., Vincent, N. S., & Newell, C. A. *The growing edge*. New York: Metropolitan School Study Council, 1946.
- Raymond, R. Determinants of the quality of primary and secondary public education in West Virginia. *The Journal of Human Resources*, 1968, 3, 450-470.
- Thomas, J. A. Efficiency in education: An empirical study. *Administrators' Notebook*, October, 1962.

K. F. KENNETT

Intelligence and Socioeconomic Status in a Canadian Sample

The positive relationship, in favour of upper socioeconomic status children, between intelligence and socioeconomic status was subjected to further investigation. In a somewhat homogeneous sample of children, upper socioeconomic status children were found to be intellectually superior to middle class children even though all lived in similar residential areas and attended the same schools. Such a finding suggests that upper socioeconomic status children, on the whole, are intellectually superior to middle class children because of inherited factors, or environmental factors originating in the home, or both. (Dr. Kennett is an Assistant Professor of Psychology at St. Francis Xavier University Sydney Campus, Sydney, Nova Scotia.)

Although traditional measures of intelligence attempt to assess only a few of man's thinking abilities (Cropley, 1967; Getzels and Jackson, 1962; Torrance, 1962) they do provide some source of predictability and comparison among individuals. Of importance to this comparison is the influence of environmental factors upon the performance of individuals on conventional intelligence tests. Environmental factors do influence such performances and these effects have repeatedly been demonstrated in a large number of studies including those of Bernstein (1960), Centers (1950), Davis (1948), Gordon (1923) and Riessman (1962). In fact, mental tests measure human behavior, and environmental factors affect the degree of efficiency of this behavior. Thus home, school and social class, as aspects of environment, have an important influence upon how well individuals perform.

Already there are a considerable number of studies (Anastasi, 1958; Burt, 1922; Eells, Davis, Havighurst, Herrick and Tyler, 1951; MacArthur and Elley, 1963) which have related measured intelligence, Intelligence C (Vernon, 1955), with social class environment. A positive relationship, in favour of upper social class children, has been demonstrated between intelligence (IQ) and socioeconomic status (SES). For example, Davis

(1948) clearly demonstrated the strong relationship between SES and Intelligence C by showing that items on a number of frequently used mental tests significantly discriminated between socioeconomic groups. This discrimination among children by IQ tests, according to SES, has been reported since the turn of the twentieth century. Binet and Simon (1916), in explaining the difference between their norms and those obtained for a sample of Belgian children, pointed to factors which depend 'partly upon family circumstances'. Stern (1914), with upper class German children, and Burt (1922), in an examination of social classes in England, came to the same conclusion.

Whether the superior performance by upper SES children over lower SES children on conventional intelligence tests results mainly from heredity or environment is unknown. What is known is that every measurable ability is the product of a genetic potential interacting with certain postnatal and environmental conditions (Burt, 1949). The reflection of class differences in the scores obtained on intelligence measures is understandable when it is realized that certain segments of the society are confronted with tasks requiring skills which facilitate or impede individuals and sub-groups in particular ways because of social experience.

In an examination of the relationship between IQ and SES an important skill which separates one social group from one another is that of language. This is not surprising when it is realized that the ability to manipulate verbal symbols seems to play an important part in the process of thinking and problem solving. Terman and Merrill (1937) considered language to be essentially, the shorthand of the higher thought process. Eells, *et al.*, (1951) indicated that SES was the chief factor affecting scores on intelligence tests, and pointed out that the largest advantage gained by middle or upper SES children was on verbal items. Success in school is based on a facility to handle a middle-class vocabulary, for the middle-class child is capable of responding to, manipulating and understanding a public language (Bernstein, 1958).

Past research has indicated that children from middle to upper class groups possess an adequate public language and in a comparison with lower SES children, show a superior performance on conventional tests of intelligence. However, such findings have frequently been based on comparisons between the polarities of social class membership, while less frequent examinations have been made among children within a broad social class such as the middle class. Thus, the present study examined the importance of socioeconomic status, based on father's occupation and confirmed by the MacArthur-Elley modification (1963) of the Gough Home-Index (1949), in influencing the performance, on an IQ test, of children who seemed to have opportunities for similar social and environmental experiences in terms of dwelling area, formal schooling, teachers, and peer-relationships. Hence, the present study was concerned with extending the usual relationship between IQ and SES by selecting a somewhat homogeneous school sample.

Method

Subjects

The subjects consisted of virtually the entire grade six, seven and eight population of two Regina Elementary Public Board Schools, situated in middle class residential areas. Of the total enrolment of 198 children, 170 were eventually used as subjects in the study. The remaining 28 children (18 males and 10 females, of whom 14 attended each school) were excluded, with the aid of a table of random numbers, because they had siblings among the other 170 children. Thus, this ensured that only one child from each family was in the study, and avoided bias in the data resulting from familial similarity among subjects. The subjects included 91 boys for whom the mean verbal IQ was 110.7 (SD = 10.2; range 83-129), while the corresponding figure for the 79 girls was 113.0 (SD = 9.7; range 87-133). The mean age of the boys was 12 years 9 months (SD = 12.4 months; range—11 years 2 months to 15 years 9 months) and the girls 12 years 8 months (SD = 11.7 months; range—11 years 2 months to 15 years 3 months).

Tests

The specific intelligence test used was the Otis Quick Scoring Mental Ability Test: Beta Form: Test A, an instrument particularly suited to the measurement of a general intelligence based on verbal skills for children in Grade Six, Seven and Eight.

Socioeconomic status was based on father's occupation (Kahl & Davis, 1955) and on the life-style of the subjects. The latter was scored in terms of the general "goodness" of his family life (MacArthur & Elley modification of the Gough Home-Index, 1963).

Procedure

The Otis Mental Ability Test was administered to the initial sample of children in December, 1968. Later, in March, 1969, the MacArthur-Elley version of the Gough Home-Index was completed by each child.

On the basis of the information collected, the 170 children were placed into SES groups (Davis, Gardner & Gardner, 1941; Edwards, 1943). Social Class I included children from professional homes, Social Class II children whose fathers were semi-professional and managerial, Social Class III those from families where the father belonged to the occupational group of lower managerial, salesmen and clerks, Social Class IV children of skilled workers, supervisors in trades, and tradesmen, while the two lowest groups consisted of children of semi-skilled and unskilled fathers. These two groups were pooled to form Social Class V, because of the small number of children in each. These five SES groups contained 21.8, 27.1, 27.6, 15.3 and 8.2% of the total sample, respectively.

Data Analysis

Differences in mean IQs among socio-economic status groups, further subdivided according to sex, were tested using the two-way analysis of variance procedure described by Winer (1962, pp. 241-242).

Results

Analysis of variance showed a definite relationship between intelligence and socio-economic status ($F = 11.03$, $df = 4/160$; $P < 0.01$), and further confirmed the numerous studies which have reported a positive relationship between IQ and SES. Mean and standard deviations of IQ scores for the five SES groups are shown in Table 1.

TABLE 1
MEANS AND STANDARD DEVIATIONS OF IQ SCORES FOR SEX GROUPS
AND FULL SAMPLE DIVIDED INTO SES SUBGROUPS

Subjects		SES Subgroups				
		I	II	III	IV	V
Male (N = 91)	N	20	22	25	16	8
	Means	115.0	116.0	106.8	108.6	101.9
	SD	9.8	6.7	9.2	9.7	10.9
Female (N = 79)	N	17	24	22	10	6
	Means	117.5	117.3	108.3	110.3	104.7
	SD	7.7	7.2	8.0	9.4	13.6
Total (N = 170)	N	37	46	47	26	14
	Mean	116.1	116.7	107.5	109.3	103.1
	SD	8.8	7.0	8.6	9.6	12.2

Note—These data satisfy the requirements of within cell homogeneity of variance ($F_{max} = 4.1$; $df = 10/24$)

A summary of the analysis of variance on these data is shown in Table 2.

In the examination of the results relating to the relationship between IQ and SES, multiple t tests (Winer, 1962, p. 244) showed that the mean IQs of the two highest SES groups differed significantly from virtually all those obtained for the three lowest groups, among males and females separately, and also in the case of the full sample, but not from each other.

The strong relationship between SES and IQ, in favour of the highest SES groups, was confirmed by correlational data. The correlations between SES and IQ for males, females and the full sample respectively were 0.41 ($df = 168$, $p < 0.01$), 0.41 ($df = 77$; $p < 0.01$) and again 0.41 ($df = 0.01$). The scores for SES, based on the Home-Index scores, were closely related to those based on father's occupation, and acted as a construct validity test of the measure of SES used. The full sample correlation

TABLE 2

SUMMARY OF ANALYSIS OF VARIANCE FOR SOCIOECONOMIC STATUS,
SEX AND INTELLIGENCE

Source	Sum of Squares	df	Mean Square	F
Sex	129.2	1	129.2	1.57
SES	3,624.1	4	906.0	11.03*
Sex x SES	10.88	4	3.0	0.04
Within Cell	13,152	160	82.2	

* $p < 0.01$

between Home-Index and scores on occupational status was 0.50 (df = 168; $p < 0.01$).

Discussion

The findings of the present study further support the numerous studies which have clearly shown that a definite relationship exists between intelligence and socioeconomic status, in favour of the high SES groups. Furthermore, the results indicate that within a somewhat homogeneous Canadian school sample, this relationship still remains. In many studies (e.g. Eells *et al.*, 1951) the chief factor affecting scores on intelligence tests has been socioeconomic status, in terms of comparisons between the upper and middle class as a distinct school population on the one hand, and the lower class on the other. The major difference between these two broad SES groups has been on performance on verbal items (Eells *et al.*, 1951), for, although deprived children use a great many words with a fair amount of precision, such words are not words used in school. The present research would indicate a finer relationship, placed on a continuum, in which middle class children may possess a school, or formal, language (Bernstein, 1958) but an inferior one to upper SES children.

The present study examined subjects from a homogeneous middle-class community (Havighurst, 1961). However, certain subjects may have differed in terms of a superior prestige rating because of father's occupation and additional cultural and luxurious possessions within the home (Kahl, 1956). The Home-Index confirmed the latter. Thus, the family environment with its possessions and position of prestige based on father's occupation, may still be of considerable importance, even in samples of children who enjoy the apparent outward benefit of similar residential areas and formal schooling. The general lumping, of middle and upper SES children, for comparison with lower SES children on intelligence C may hide relevant and pertinent differences which still exist between the upper and middle class child.

References

- Anastasi, A. Heredity, environment and the question "How"? *Psychological Review*, 1958, 65, 197-208.
- Bernstein, B. Some sociological determinants of perception. *British Journal of Sociology*, 1958, 9, 159-174.
- Bernstein, B. Language and social class. *British Journal of Sociology*, 1960, 11, 271-276.
- Binet, A., & Simon, T. *The development of intelligence in children*. Baltimore: Williams and Wilkins, 1916.
- Burt, C. *Mental and scholastic tests*. London: Staples, 1922.
- Burt, C. The structure of the mind: a review of the results of factor analysis. *British Journal of Educational Psychology*, 1949, 19, 176-199.
- Centers, R. Four studies in psychology and social status: a special review. *Psychological Bulletin*, 1950, 47, 263-271.
- Cropley, A. J. *Creativity*. London: Longmans, Green, 1967.
- Davis, W. A. *Social-class influences upon learning*. Cambridge: Harvard University Press, 1948.
- Davis, W. A., Gardner, B. B., & Gardner, M. R. *Deep south*. Chicago: Chicago University Press, 1941.
- Edwards, A. M. *Comparative occupational statistics for the U.S. 1870-1940*. Washington: Washington Government Printing Office, 1943.
- Eells, K., Davis, W. A., Havighurst, R. J., Herrick, V. E., & Tyler, R. W. *Intelligence and cultural differences*. Chicago: Chicago University Press, 1951.
- Getzels, J. W. & Jackson, P. W. *Creativity and intelligence*. New York: Wiley, 1962.
- Gordon, H. *Mental and scholastic tests among retarded children*. London: Board of Education Pamphlet No. 44, 1923.
- Gough, H. A short social status inventory. *Journal of Educational Psychology*, 1949, 40, 52-56.
- Havighurst, R. J. Social class influences on American education. In Henry, N. B. (Ed.). *Social forces influencing American education: Yearbook of the National Society for the Study of Education*, 60. Chicago: Chicago University Press, 1961.
- Kahl, J. A., & Davis, A. J. Comparison of indices of socio-economic status. *American Sociological Review*, 1955, 20, 317-332.
- Kahl, J. A. *The American class struggle*. New York: Holt, Rinehart, Winston, 1957.
- MacArthur, R. S. & Elley, W. B. The reduction of socioeconomic bias in intelligence testing. *British Journal of Educational Psychology*, 1963, 33, 107-119.
- Riessman, F. *The culturally deprived child*. New York: Harper & Row, 1962.
- Stern, W. *The psychological methods of testing intelligence*. Baltimore: Warwick and York, 1914.
- Terman, L. M., & Merrill, M. A. *Measuring intelligence*. London: Harrap, 1937.
- Torrance, E. P. *Guiding creative talent*. New Jersey: Prentice-Hall, 1962.
- Vernon, P. E. The assessment of children: University of London Institute of Education. *Studies in Education*, 1955, 7, 198-215.
- Winer, B. J. *Statistical principles in experimental design*. New York: McGraw-Hill, 1962.

L. LEHTINIEMI

A Tested Theory of Student Unrest¹

Status inconsistency arising from simultaneous student and adult role prescriptions may be a source of stress which can lead to protest activity under certain conditions. A number of hypotheses derived from the general theory were tested using data yielded by 225 questionnaires obtained from undergraduates at two Ontario universities during the 1969-70 academic year. Results of the analysis indicated that students who approximate adults more than "pre-adults" were more likely to have been involved in protests and also to have been more actively involved. It is suggested that one means of reducing status inconsistency is to acknowledge the adult status of a growing proportion of students by granting them participation on decision making bodies in the academic community. (Mr. Lehtiniemi is with the Industrial Training Branch of the Ontario Department of Labour.)

Student unrest appears to have waned even more quickly than it emerged as an activity common to many Canadian and American campuses. Relatively few incidents of collective action by students attempting to stimulate institutional change have been reported since the spring of 1970. However, little in fact is yet known about why student activism emerged when it did, and as suddenly as it did. The phenomenon inspired many armchair analysts, but few researchers. One must literally dig through the speculative offerings to isolate a relative handful of empirical studies. Even then, it is difficult to find studies that empirically test hypotheses derived from theoretical explanations, as opposed to those which merely describe characteristics of some activist students.

To some, the paucity of tested explanations may be of little concern. Instead, they are relieved that students appear to have "returned to their senses" and are now behaving in a more normal manner. In contrast,

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educators and the social scientists should still be interested in understanding student unrest, whether it be to satisfy intellectual curiosity, or from a more pragmatic standpoint, to be better able to prevent or cope with future disturbances. It is to such an audience that this brief summary of a proposed theory of student unrest, and some of the empirical findings which thus far favourably support it, are directed.

Theoretical Considerations

Education has undergone rapid change since the advent of the Atomic Age, and especially during the last decade. Of particular significance are the changes in the student population at the post-secondary levels of education. Universities and colleges are no longer the almost exclusive "finishing schools" for the children of a privileged elite. Student enrolments have multiplied, and the socio-economic base from which students are drawn has broadened since student-aid programmes were introduced. Also, more students are remaining longer in the educational setting, and more older students are returning to complete or continue formal studies. A separate trend, and one not exclusive to education and students, is that young people appear to be maturing at an earlier age. The recent lowering of the voting age in many political jurisdictions is one indicator of this change. The net effect, in brief, is that more students are now also adults, by legal definition at least, but often by cultural definitions as well.

The significance of this trend becomes apparent if one examines the cultural meanings which have over time become associated with the student role. Since the time of the early Greeks the student role has embodied both pre-adulthood and dependence. With the relatively recent introduction of compulsory education, student and childhood became almost synonymous. Even until modern times university was often regarded by the few who could afford to attend as an extension of adolescent irresponsibility—a deferment of adulthood. Studenthood has historically been equated with a period of *becoming*, only at the end of which the student entered adult society.

The concept of *in loco parentis* was entirely consistent with this definition of the student role, but more important, it also emphasized the subordinate position of the student to the educator, not only in things academic but in all matters. It is specifically because students were perceived as pre-adult that the educators assumed the surrogate parental role and responsibilities, and one might add, rights over the activities of the students. The subordinate position of students is still symbolically manifested in the final rites of passage when the university graduand often kneels in a final act of submission while receiving his "colour". How quaint—yet so consistent with the traditional, cultural definition of the student role.

A revised definition of the student role consistent with changed reality has not yet emerged. Thus many students find themselves with dual and incompatible roles and statutes. On the one hand, they are often adults by virtue of age, marital status, financial independence, and other criteria associated with adulthood in our culture. But at the same time, they are also students. As such they are perceived as pre-adults in need of mature

guidance by their elders, including the educators who see themselves in a quasi-parental role. Today's student-adults experience status inconsistency which is not conducive to effective social interaction, and which is a source of stress.

As students, they probably accept as legitimate their academically subordinate position relative to faculty. Presumably they attend university because they hope, among other things, to acquire some knowledge from their mentors. Even when they clamour for more power to set curricula, they assume that the faculty will be able to offer instruction in the desired "new" courses.

However, the students who perceive themselves as adults may *not* be willing to accept subordination to educators in the non-academic dimensions of university life. Some of the student-adults expect to be treated, and listened to as adults in non-learning interaction situations. They act accordingly. Their behaviour may violate the role expectations of those educators and administrators who perceive them primarily as students, hence pre-adult, dependent, and subordinate. Given that the two parties hold different perceptions of the status of the student-adults, it is easy to understand why effective communication (from the stand-point of the student) is often lacking. In lay English, they talk past each other because they see the same thing differently. Because the educator has institutionalized authority on his side, the student-adult must often tolerate the frustration of being regarded and treated as only a student.

The increasing economic necessity for advanced formal education deters the student-adult from withdrawing from the situation. Instead he must manage his emotions and continue to accept his "non-academic" subordination even if he may not consider it legitimate. If, however, an incident occurs which is perceived by the student-adult as a major infringement on his rights as an adult, whether it affects him directly or affects others with whom he identifies, it can mobilize him to protest activity if other channels of communication are believed to be ineffective. These critical incidents, which have been cited by some observers as the causes of student unrest, are only "triggering mechanisms" that depend upon the underlying stress arising from status inconsistency for their effects. The students who are provoked sufficiently to protest, then, will most likely be those who by cultural definition are both students and adults.

The theory of student unrest proposed here can be summarized as follows. Changes have recently occurred in education which have rendered the traditional cultural definition of the student role inadequate to guide effective interaction between educators and those students who are also adults. A revised cultural definition of student-adults consistent with the present reality, and specifying their rights, duties, and obligations, has not yet been formulated. These conditions are conducive to status inconsistency among some students and may be a source of stress that makes them prone to demonstrate given a critical incident which they perceive as an infringement upon their rights as adults.

Given this theoretical formulation, the specific issues about which students engage in protests are viewed only as "triggering mechanisms" of secondary importance to an understanding of student unrest. One would predict that, regardless of the apparent issue, the students who

are likely to experience status inconsistency (that is, those who possess characteristics associated with adult status in our culture) are more likely to become involved in protests than are other students. Further, involvement in protests should vary directly as the degree of status discrepancy. These two general statements were tested using two sets of more specific hypotheses (Lehtiniemi, 1970).

Procedure

Sample

To evaluate this theory of student unrest, a questionnaire was devised and administered to undergraduate students at two Ontario universities during the 1969-70 academic year. All respondents were enrolled in sociology courses, as previous studies had indicated that activist students were most highly concentrated in the social sciences (e.g. Trent & Craise, 1967). The questionnaire was administered to complete classes of students during scheduled lecture periods. Using this method, questionnaire non-response was negligible, and less than three per cent of the questionnaires were not usable because of excessive item non-response, or response patterns that indicated lying or disinterest on the part of respondents. A total of 225 usable questionnaires were obtained for analysis. This sample was adequate because the purpose was to test theory, and not to generalize descriptive properties to a larger population (on this issue, see Zetterberg, 1965:128-130).

Measures

Critical questionnaire items inquired about the sex, financial status, type of living accommodation, and decision-making practices in the family of origin of each respondent. These were selected as the independent variables in this study.

The respondents were also asked whether they had attended any of the various protests in which students from their university were known to have taken part and to indicate if they had become actively involved themselves. More than half of the respondents had attended at least one protest; 33 per cent indicated that they had actively participated in a protest. Actual involvement in protests was defined as the dependent variable.

Method

Two sets of hypotheses were tested. In the first set, the relationship between each of the four independent variables and involvement in protests was examined. It was predicted in each case that students who along an assumed dimension possessed attributes more characteristic of adulthood than "pre-adulthood" (i.e. those who would probably experience status inconsistency) were more likely to have been actively involved in protests than other students. The percentage of students in this category who had been involved in protests was compared to the percentage of the other students who had actively participated in protests.

A second set of hypotheses specified that the degree of potential status inconsistency would be positively related to student involvement in protests. To test for the predicted relationships, six typologies were constructed

by pairing the four independent variables in all ways possible. Three levels of status discrepancy were defined. Students who might be considered adults on both independent variables used in a given typology were designated as experiencing high status inconsistency. Those who would be considered adults on either one of the two variables were classified as experiencing moderate status inconsistency. The remaining students were regarded as low status discrepancy types. The hypotheses were tested by comparing the percentages of students in the three categories who had been actively involved in protests.

It was also argued that the effects of the independent variables would be additive. This was tested by comparing the measures of association obtained using the typologies with those obtained using the component variables separately. For these comparisons it was necessary to combine the moderate and low status inconsistency categories in each typology, even though collapsing would attenuate the measures of association obtained. Two unrelated measures of association were used in the comparisons to ensure that the results were not artifacts of the different "N's" in the cells.

Results

Using the four independent variables separately, all hypotheses in the first set were supported. For each variable, the students who approximated adults more than "pre-adults" (i.e. those who would experience status inconsistency) were more likely to have been involved in protests than other students. The relationships obtained are listed below, and the level of statistical significance of each is shown in brackets.

1. Students accustomed to taking part in making decisions that affected them (those who had taken active part in decision-making at home) were more likely to have been actively involved in protests than other students ($p < .02$).
2. Students who were financially independent of their parents were more likely to have been actively involved in protests than other students ($p < .02$).
3. Students living in "their own" independent place of residence were more likely to have been actively involved in protests than other students ($p < .05$).
4. Male students were more likely to have been actively involved in protests than female students ($p < .005$).

The relationship shown in Table 1 is typical of those obtained using the independent variables singly. The sex difference was expected because the male role in our culture emphasizes "becoming a man" by attaining autonomy and independence soon after physical maturation. In contrast, the female role is still characterized by dependence. In determining the statistical significance of the relationships, chi square values for these 2x2 tables were transformed to Z-scores (see Blalock, 1960, 218-219). Because the direction of the relationships was predicted, the probability associated with the chi square values was halved for a one-tail test of statistical significance.

TABLE 1
SEX OF STUDENTS AND INVOLVEMENT IN PROTESTS

Involvement in protest	Sex			
	Male		Female	
	(N)	(%)	(N)	(%)
Yes	50	40	24	24*
No	74	60	77	76
Totals	124	100	101	100

* $p < .005$ (one-tail chi square test)

The second set of hypotheses was also supported without exception. For each of the six typologies the students with high status inconsistency were the most likely to have been actively involved in protests. Low status inconsistency types were least likely to have been involved in each case. All six relationships were statistically significant beyond the .01 level. Table 2 shows a typical relationship. Sex and financial status were the component, independent variables used in that typology.

TABLE 2
LEVEL OF STATUS INCONSISTENCY AND INVOLVEMENT IN PROTESTS

Involvement in protests	Level of Status Inconsistency					
	High		Moderate		Low	
	(N)	(%)	(N)	(%)	(N)	(%)
Yes	41	45	21	27	12	22*
No	50	55	58	73	43	78
Totals	91	100	79	100	55	100

* $p < .005$ (one-tail chi square test)

The effects of the independent variables were additive. The measures of association obtained using any pair of variables together were in every case greater than those observed using either single independent variable. When *epsilon* values were compared, the strength of the relationships obtained using typologies exceeded those obtained using single, component variables by between two and eight percentage points. It should be noted that a conservative bias in the measures of association obtained using typologies was introduced by collapsing the moderate and low status inconsistency categories to produce dichotomies. When chi square values were compared, the relationships observed using typologies were again more significant statistically than those obtained using the component, independent variables separately.

Discussion

All the relationships examined in this study were in the predicted direction. These findings support the suggested explanation of student unrest. The degree to which they can be generalized, however, is an empirical question for the sample was restricted to undergraduates enrolled in sociology courses at only two Ontario universities. Nevertheless, until further research shows this explanation to be inadequate, it should not be disregarded in favour of speculative "quasi-theories" of student unrest.

If student unrest is interpreted as an outcome of social change which has rendered the traditional role definition of the student inadequate for today's social reality, then there are implications concerning how educators should respond. Rigid enforcement of the "established ways", backed up by police and legal sanctions appears to have been a response bearing high "costs" in terms of property damage and inciting sympathy protests. It can hardly be considered a positive mode of adaptation, and while it may have resulted in suppression of student unrest, it is a response to symptoms rather than to causes. Should a "law and order" mentality prevail, one might expect a build-up of higher levels of stress among student-adults, which when "triggered" could lead to more serious forms of protest activity. Alternatively students who now experience status discrepancy, if deterred from trying to help redefine their role, might be expected to succumb to behavioural disorders which have been associated with norm inadequacy. In this vein, Durkheim's (1951) classic study showing the relationship between anomie and suicide would perhaps be the most forceful example. Insisting on maintaining the *status quo*, as some educators have done by enforcing tradition, must be regarded as only "buying time", and the investment may be a poor one.

Instead of reaffirming existing status relationships in education, one might explore how they could be revised in order to cope more effectively with the demands of today. The traditional structure of education is not sacred. It is only a means to a higher end, that of conveying information, knowledge, and the ability to think and adapt to a usually younger generation to prepare them to cope with present and future conditions in society. If the system cannot function effectively as it exists as present, and it is questionable whether disruption and the process of education are compatible, then we must seek to improve it. The focus should not be exclusively on what is wrong with the students but also on what might be wrong with the structure of education. While this latter orientation might appear as a threat to the security of some educators who have grown accustomed to their generalized statuses vis-a-vis the students, it should not be summarily dismissed as a potential means of successful adaptation to changed social conditions.

Fortunately, some educational administrators have initiated institutional changes, although usually in response to or as a result of on-going or threatened disturbances. Foster and Long (1970) cite examples at American universities, and readers familiar with higher education in Canada will be aware that parallel events are taking place at many Canadian universities. In many cases these changes do entail a redefinition of the status of students, evidenced by the broadened rights and privileges implicitly conferred upon them, especially with regard to partici-

pation on decision-making bodies at various levels within the university. The effectiveness of these changes as a means of successfully adapting to changed social reality cannot yet be realistically evaluated. However, on the basis of the theory of student unrest suggested here, one would predict that granting the student the rights of adulthood in the academic community will reduce future unrest on the campuses.

References

- Blalock, H. M. *Social statistics*. New York: McGraw-Hill, 1960.
- Durkheim, E. *Suicide*. (J. A. Spaulding & G. Simpson, trans.), Glencoe, Illinois: Free Press, 1951.
- Foster, J., & Long, D. The dynamics of institutional response. In J. Foster & D. Long (Eds.), *Protest! student activism in America*. New York: Morrow, 1970.
- Lehtiniemi, L. *A theory of student unrest*. Unpublished M.A. thesis, University of Waterloo, 1970.
- Trent, J. W. & Craise, J. L. Commitment and conformity in the American college. *Journal of Social Issues*, 1967, 22, No. 3, 34-51.
- Zetterberg, H. L. *On theory and verification in sociology*. Totowa, N.J.: Bedminster Press, 1965.

P. C. SMYTHE, MADELINE HARDY,
R. G. STENNETT, and H. R. WILSON

Developmental Patterns in Elemental Reading Skills: Phoneme Discrimination¹

In an attempt to develop a brief test of children's ability to discriminate among 42 English phonemes, 104 children in grades 1-4 were required to make a judgment of "same" or "not the same" to each of 1,291 pairs of items. The ratio of "not the same" (target) items to "same" (buffer) items was 2:1. The test items were administered as 60-item subtests, one per day, over a three-week period. Data analysis revealed developmental trends and an unexpectedly high level of competence in children's ability to discriminate among "pure" phonemes. The results are related to more commonly used tests of children's auditory discrimination. (Dr. Smythe, Research Associate, and Dr. Stennett, Chief of Educational Research Services, are members of the London Board of Education; Dr. Hardy is an Associate Professor at Althouse College of Education; Dr. Wilson is Chairman of the Linguistics Group, English Department, University of Western Ontario. All of these institutions are located in London, Ontario.)

In connection with a larger study attempting to determine the development of some of the elemental skills involved in learning to read (Stennett, Smythe, Hardy, Wilson & Thurlow, 1970), a preliminary investigation was made of the development of children's ability to discriminate phonemes. Preceding this study a review of the literature in the area of auditory abilities (Hardy, Stennett, & Smythe, 1970) revealed considerable agreement among authorities that auditory perception was considered a critical factor in learning to read and was closely related to reading performance.

The area of auditory discrimination or perception at the level of individual phonemes has not been widely investigated in relation to beginning

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reading. Moreover, because of difficulty with measurement at early ages, most of the work has been done with school-age children. Templin (1957) conducted an extensive study with children from three to eight years of age and discovered that sound discrimination ability showed consistent increase with age, with a deceleration of the rate of growth occurring between four years, six months and five years. Impellizzeri (1967) also found a developmental trend in auditory perceptual ability of normal children aged five to eight years.

The concept of distinctive features of speech sounds was used by Jacobson and Halle (Cherry, 1965) in presenting a developmental description of speech discrimination acquisition. The results of their work indicate that acquisition follows a sequence of successive binary contrasts, from those that are highly discriminable to those with minimal difference. Tikofsky and McNish (1968), using the concept of distinctive features as developed by Jacobson and Halle, determined that by the age of seven years children are able to discriminate accurately between initial consonants, except for a small group of contrasting consonants which are difficult even for adults.

In spite of the importance of auditory perception in the process of learning to read, the available developmental data on the acquisition of this skill are much too global in nature. Although it has been determined that developmental trends in the acquisition of auditory perception do exist, there is no information regarding the age levels at which certain phoneme discriminations are established. How many phonemes, and which ones, for example, can children be expected to discriminate upon entering grade one?

As well as being too global in its approach, interpretation of the research findings on auditory perception is complicated by the variety of approaches used in test construction. Tests of phoneme discrimination have typically employed comparisons of simple words or nonsense syllables, with the child being required to make a judgment of similarity or difference. With the three to five-year-old subjects, Templin (1957) used pairs of words such as 'coat-goat', and with children from six to eight years, pairs of nonsense syllables such as 'os—oth'. Tikofsky and McNish (1968) also employed pairs of words or syllables in their study while Impellizzeri (1967) used pictures in part of her study, with the child required to choose from four pictures the one which matched the stimulus word presented. All methods described suffer from lack of precision due to the possible contribution of factors other than auditory perceptual ability. The demands of what appears to be a simple test of auditory discrimination are indeed very complex. In tests using the 'similarity-difference' response format, the subject is required to attend to the two stimuli being presented, retain these several sounds in memory, internally compare the sounds or their representations, and make a decision of similarity or difference. An excellent review and critique of several of the more widely used tests of auditory discrimination is contained in a recent study by Rudegeair and Kamil (1970).

Because of the potential complexity of task demands and, more importantly, of the interpretation of results of a test using nonsense syllables

or words, it was decided to attempt to construct a test of auditory discrimination using the forty-two simplest sound elements in the English language, the ‘pure’ phonemes, pairing each of them with every other phoneme.

Method

Subjects

The 104 subjects involved in this study were enrolled in grades 1 through 4 at the Emily Carr Public School in London, Ontario. The number of pupils at each grade level was: grade 1-28, grade 2-28, grade 3-27, and grade 4-21. A preliminary pilot investigation indicated that the test format and task demands were too difficult for children below the grade 1 level.

Test Construction

The forty-two phonemes used in this study are presented in Table 1.

TABLE 1
FORTY-TWO PHONEMES USED IN TEST CONSTRUCTION
ALONG WITH THEIR IPA EQUIVALENTS

Phoneme	I P A Symbol	Phoneme	I P A Symbol
ē	i	f	f
ī	I	h	h
ě	e	w	w
ǎ	æ	y	j
ǒ	ɔ	k	k
ǔ	ʌ	b	b
oo	u	d	d
ōō	u	g	g
ō	o	r	r
schwa	ə	s	s
ā	e	sh	ʃ
ī	ai	ch	tʃ
ū	ju	t	t
ar	ər	th ₁	θ
ur	ʒr	v	v
ow	ay	l	l
oy	oi	th ₂	ð
m	m	z	z
n	n	ʒ ^h	ʒ
ng	ŋ	j	dʒ
p	p	wh	hw

Note—Notation based on the system employed by the International Phonetic Association.

It was not possible on the basis of existing knowledge to develop rational, *a priori* techniques for sampling from the population of all pairwise comparisons of the 42 phonemes. Therefore, it was necessary to test each phoneme against all other phonemes. As this procedure results in a massively large number of comparisons, it was further decided to test

for item discrimination in one direction only. Thus, the pair /ă/-/ā/ might be included whereas the pair /ā/-/ă/ would not. The choice of one pairing direction rather than the other was determined in a random and somewhat arbitrary fashion. All heterogeneous pairs (i.e. vowel-consonant) were presented only in the order vowel-consonant and never as consonant-vowel. With all 42 phonemes paired in this manner, a total of 861 pairs were formed with the following number of pairs in each category; Vowel-Vowel (V-V) 78, Consonant-Consonant (C-C) 406, and Vowel-Consonant (V-C) 377. As the discrimination test required subjects to make a judgement of "same" or "not the same"² it was also necessary to create a number of buffer pairs made up of pairings of the same phoneme with itself. The ratio of "same" (buffer) items to "not the same" (target) items was also determined, in part, by practical considerations. In order to control for guessing or random responding yet keep the size of the test within reasonable limits, a ratio of two target items to one buffer item was selected. That is, another 430 pairs of buffer items were combined with the 861 target pairs to produce a test involving 1,291 paired comparisons. The 430 homogeneous buffer pairs contained 88 V-V and 342 C-C pairs.

For purposes of administration, the 1,291 pairs were used to create 21, 60-pair subtests and one final subtest of 31 pairs. Each 60-pair subtest was composed of 40 target items (4 V-V, 19 C-C, and 17 V-C) and 20 buffer items (4 V-V and 16 C-C). The 31-pair subtest included all target items left after the 60-pair tests were constructed (0 V-V, 9 C-C, 12 V-C) along with buffer items (5 V-V and 5 C-C). The ordering of items within any subtest was randomly determined.

Test Administration

Each of the twenty-two subtests of the phoneme discrimination test was tape recorded by one of the authors. Items were recorded at the rate of one pair per two seconds with a three second inter-pair interval during which subjects made their responses. The tests were administered by a teacher who was given instruction in the necessary procedures and techniques.³ Testing was carried out in the language laboratory of Sir Frederick Banting Secondary School, the building in which the Emily Carr Public School was located.

Before being taken to the language laboratory, the test administrator and the supervisor worked with each class in their individual classrooms in order to familiarize the children with the procedures to be used in the actual testing. The pupils were asked to listen to and discriminate between pairs of phonemes and to state orally whether they were the same or not the same. They were then taught to record their responses to ten practice items on a pre-printed answer sheet which contained spaces for responses to six sets of ten phoneme discriminations. A check mark was used to indicate a phoneme pair which was the same and an X to indicate a pair that was different. Following this classroom work, each class was taken to the language laboratory for a trial run using the earphones, taped sounds, and the answer sheet.

² A preliminary investigation suggested that the "same-not the same" concept was less ambiguous or was at least more clearly understood than the concept "same-different" for the youngest age group tested.

³ Dr. Hardy made the tapes and supervised their administration which was carried out by Mrs. M. Singeris.

The twenty-two subtests were administered during a period of twenty-two consecutive school days in May and June, 1970. Testing time was twelve minutes per class per day. At the end of the testing period several days were used for make-up testing with pupils who had been absent.

Data Handling and Analysis

All data for each child were coded, keypunched into cards, verified, written onto magnetic tape, edited and corrected. All subsequent analyses were done using an IBM 7040 computer.

The basic analyses to be reported include: (1) a comparison of children's overall performance as a function of grade level, (2) as a function of pair type and (3) a factor analytic examination of errors made on the target pairs by all children.

Results

Performance as a Function of Grade Level

A percent correct score for each child was calculated by computer based on his responses to all of the 1,291 items. A one-way analysis of variance was then computed using these scores with grade as an independent factor. Table 2 presents the mean percent correct responses to all test items for each of the grades.

TABLE 2
MEAN PERCENT CORRECT PHONEME PAIR DISCRIMINATIONS FOR
1,291 PAIRS AS A FUNCTION OF GRADE LEVEL

	Grade			
	1	2	3	4
M	90.46%	92.50%	95.92%	97.05%
SD	9.62%	6.10%	2.51%	1.99%
N	28	28	27	21

The analysis of variance yielded an F of 6.247 which was highly significant ($df = 3/100$, $p < .001$). Inspection of Table 2 reveals a clear developmental trend with performance increasing with grade level. To test the significance of the differences between the various grade-level means, a series of comparisons were made employing the Scheffé method (Ferguson, 1966, p 295). Using the fairly stringent criteria for significance that the Scheffé method requires, only two comparisons reached significance. Both of these involved the grade 1 class; in one case with grade 3, $F_{(1-3)} = 10.919$, $df = 3/100$, $p < .05$, and in the other grade 4 performance $F_{(1-4)} = 13.920$, $df = 3/100$, $p < .01$. As well as the clear developmental trends another striking feature of the data revealed in Table 2 is the impressive level of performance for all four groups. Even the grade 1 pupils were able to master an average of 90% or 1,162 of the 1,291 target item discriminations.

Performance as a Function of Pair Type

Table 3 presents the mean percentage of correct responses to each phoneme and (a) all of the comparisons of it with each vowel, and (b) all of the comparisons of it with each consonant.

TABLE 3
MEAN PERCENT CORRECT RESPONSES TO EACH PHONEME WHEN
PAIRED WITH ALL VOWELS AND ALL CONSONANTS

Vowel Phonemes	Vowels	Consonants	Consonant Phonemes	Vowels	Consonants
ē	1. 97.94	97.62	ar	14. 96.72	96.61
ī	2. 96.32	96.53	ur	15. 96.38	93.45
ē	3. 97.12	97.14	ow	16. 97.33	97.00
ă	4. 96.86	96.92	oy	17. 97.48	96.07
ō	5. 97.32	97.10	m	18. 98.43	95.54
ū	6. 88.94	97.17	n	19. 96.50	93.12
oo	7. 96.69	96.92	ng	20. 97.77	94.83
oo	8. 96.46	97.20	p	21. 94.64	95.26
ō	9. 96.66	97.08	f	22. 96.46	94.03
schwa	10. 90.00	97.27	h	23. 98.01	96.99
ā	11. 98.13	96.98	w	24. 96.25	95.98
ī	12. 97.66	97.37	y	25. 97.28	96.97
ū	13. 97.61	97.28	k	26. 97.78	96.84
			b	27. 97.38	96.56
			d	28. 97.08	96.78
			g	29. 96.86	94.53
			r	30. 97.25	93.94
			s	31. 97.02	97.08
			sh	32. 97.81	96.50
			ch	33. 96.88	93.27
			t	34. 97.51	96.18
			th ₁	35. 97.72	92.90
			v	36. 97.06	90.69
			l	37. 97.25	97.15
			th ₂	38. 97.02	92.79
			z	39. 98.29	95.54
			ʒh	40. 96.40	96.72
			j	41. 91.06	97.34
			wh	42. 97.25	95.11

The mean percent correct responses for each of the three basic pair types was also calculated from the data in Table 3, resulting in the following means and standard deviations; V-C, \bar{X} = 96.99%, SD = 1.11%; V-V \bar{X} = 95.98%, SD = 2.84%; C-C, \bar{X} = 95.36%, SD = 1.68%. All possible comparisons among these means were made using independent *t* tests. The only difference to reach statistical significance involved V-C and C-C pairs, (t = 4.584, *df* = 69, p < .01) with V-C performance being superior to performance on C-C pairs. Although statistically significant, this difference is small in absolute size and represents a spread of approximately 1.5% or 14 pairs.

Factor Analysis

In order to make a more detailed examination of the kinds and patterns of errors pupils made, the percentage of all students failing each pairwise comparison involving target items was calculated and placed in a matrix. This "confusion" matrix was factored using the Jacobi-Kelly technique to produce a principal axis matrix which was in turn rotated to a normalized solution using the varimax method.⁴ Five factors with eigenvalues > 1.0 were extracted and the rotated factor matrix is given in Table 4.

TABLE 4
ROTATED FACTOR MATRIX

Variable	I	II	III	IV	V	Variable	I	II	III	IV	V
1. ē	01	-04	02	02	07	22. f	-01	-01	00	87	19
2. ĭ	04	-01	03	04	14	23. h	04	-02	00	01	11
3. ě	02	-03	04	01	10	24. w	04	-04	01	01	22
4. ǎ	02	-05	02	02	10	25. y	06	-03	00	03	11
5. ǒ	06	-02	03	02	10	26. k	07	-02	03	01	08
6. ŭ	02	-02	94	-01	14	27. b	04	-01	04	01	11
7. ǒǒ	01	-04	01	03	12	28. d	05	-03	02	04	10
8. ǒǒ	03	-03	02	01	11	29. g	02	-02	03	02	09
9. ǒ	03	-02	03	02	11	30. r	01	-99	-01	-01	11
10. schwa	02	01	94	02	14	31. s	02	00	01	02	12
11. ā	02	-02	01	02	11	32. sh	01	-05	02	04	11
12. ĭ	04	-06	01	01	07	33. ch	01	-04	02	02	12
13. ū	06	-03	02	02	08	34. t	06	-04	04	02	10
14. ar	05	-03	03	01	10	35. th ₁	07	00	01	89	16
15. ur	00	-98	00	00	13	36. v	84	00	01	-01	14
16. ow	03	-02	03	04	09	37. l	06	-01	-01	04	12
17. oy	03	-05	01	03	10	38. th ₂	85	01	-03	02	14
18. m	-02	06	-09	-12	50	39. z	05	-03	00	05	14
19. n	-08	08	-08	-12	66	40. ʒh	04	-02	04	01	10
20. ng	-08	06	-04	-10	51	41. j	01	-01	02	02	11
21. p	03	-01	02	06	18	42. wh	05	-02	01	03	23

Inspection of the rotated factor matrix reveals very simple factor structures. Four of the five factors extracted are defined by loadings from single pairs of phonemes while the fifth factor receives substantial loadings from only three items. These patterns are no doubt the result of the fact that performance was near perfect, or at least very high, on almost all of the target pairs on the test and this in turn resulted in low error values entered in most of the cells of the confusion matrix. What the factor analytic solution does is to show the relationships among those few items where a substantial number of errors occurred.

Factor I is defined by loadings from the phonemes /v/ and /th_z/, both of which are fricative consonants. Both of these items are similar in terms of place of articulation and it is not surprising, therefore, that

⁴ Copies of this confusion matrix are available directly from the senior author.

students who had difficulty with one should also experience difficulty with the other.

Factor II represents confusions resulting from two phonemes involving 'r' sounds, i.e. /r/ and /ur/. Apparently the two sounds differ in such a subtle way from each other that the difference is not functionally significant for the majority of the children tested.

Factor III is a vowel confusion factor again representing two sounds which are highly similar, namely /ü/ and /schwa/.

Factor IV is another fricative confusion factor involving the phonemes /f/ and /th₁/. It is perhaps somewhat unexpected that the items in Factors I and IV should show no overlap with each other especially in the case of the two /th/phonemes.

Finally, Factor V, the most complex of the factors extracted, is defined by loadings from the three nasal phonemes /m/, /n/, and /ng/.

Summary and Conclusions

An attempt was made to develop the present test on the basis of the comparison of "pure phonemes" but, because it is virtually impossible to enunciate certain phonemes, e.g. /p/, in isolation, an unstressed vowel sound was added to the phoneme when necessary.

One of the objectives in the construction of the test was to achieve simplicity of format. Although the phoneme discrimination test is simpler than most auditory discrimination tests, performance on each pairwise comparison was obviously also influenced by certain minimal memory requirements imposed by the temporal sequencing of the pair elements.

The overall performance on the test was extremely high, at all grade levels, one to four. Nevertheless, a clear developmental trend was indicated, substantiating the earlier findings of Templin (1957) and Impelizzeri (1967).

An examination of the errors revealed that very few phoneme pairs were contributing to the test difficulty. Contrary to a previous informal hypothesis, i.e., that vowel-vowel pairs would give most difficulty, it appeared, rather, that difficult pairs were made up of consonants which were similar in place of articulation, e.g., /v/ /th₂/, /f/ /th₁/, /m/ /n/ /ng/. This finding is confirmed by similar evidence reported by Rudegeair and Kamil (1970) who suggest that most currently used tests of auditory discrimination yield an inflated estimate of discrimination difficulties. Moreover, they found that the same three contrasts accounted for 43% of all errors in one of their discrimination tasks.

It seems possible to conclude that by the time children complete grade one they experience very few phoneme discrimination difficulties, at the level of the "pure phoneme".

It is obvious that the measurement of ability in phoneme discrimination should begin prior to the end of grade one. There is need, then, for a simple and short test for use with young children. This test might be constructed using a representative sampling of phonemes, on the basis of the various categories of speech sounds. For older children, measurement of discrimination of more complex sound units should be explored, e.g. blends, digraphs and syllables.

The children in our sample represented a considerable range of reading ability (i.e., grade 1 through grade 4) and yet the corresponding range of auditory discriminatory ability at the individual phoneme level was surprisingly narrow. We would suggest, therefore, that some of the more popular tests of auditory discrimination gain some of their variability across Ss from the contribution of factors other than auditory discrimination ability. Such tests must be carefully scrutinized to discover just what factors are influencing the total test scores. The extent to which auditory discrimination scores have been shown to be correlated with success in learning to read or with tests of more advanced reading ability may merely reflect differences in these other abilities. The present results suggest that this may well be the case but, unfortunately they do not reveal just what these other factors are. At an intuitive level, such sub-skills as the ability to segment strings of auditory signals or the extent to which Ss can retain a series of individual phonemes in short-term or immediate memory become likely suspects. More formal analyses, both logical and empirical, of auditory discrimination tests will no doubt isolate other factors for investigation.

References

- Cherry, C. *On human communication: a review, a survey and a criticism*. Cambridge, Massachusetts: M.I.T. Press, 1965.
- Hardy, Madeline, Stennett, R. G. & Smythe, P. C. Concepts, instructional strategies and research in beginning reading: A review. Paper read at the Annual Meeting of the Ontario Educational Research Council, Toronto, 1970.
- Impellizzeri, Irene H. Auditory perceptual ability of normal children aged five through eight. *The Journal of Genetic Psychology*, 1967, 111, 289-294.
- Stennett, R. G., Smythe, P. C., Hardy, Madeline, Wilson, H. R., & Thurlow, Merle. Developmental patterns in elemental reading skills: Preliminary report. London Board of Education, London, Ontario, Canada, 1970. (Mimeo)
- Templin, Mildred C. *Certain language skills in children*. University of Minnesota Press, 1957.
- Tikofsky, Ronald S. & McInish, J. R. Consonant discrimination by seven year olds: A pilot study. *Psychonomic Science*, 1968, 10, 61-62.
- Rudegeair, R. E., & Kamil, M. L. Assessment of phonological discrimination in children. *Technical Report from the Research and Development Center for Cognitive Learning*, The University of Wisconsin, 1970, No. 118.

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Research in Education

Edited by F. MUSGROVE and H. J. BUTCHER

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FACULTY OF EDUCATION
The University of Alberta

EDITOR'S NOTES

In recent weeks many colleagues have paid tribute to Dr. H. T. Coutts on the occasion of his retirement as Dean of the Faculty of Education at The University of Alberta. His contributions to the field of education in general and to teacher education in particular have been widely recognized; although his contributions to educational research may have been mentioned less frequently, they are of equal significance. As a member of various University and Faculty committees, as Dean, and as a member of the Alberta Advisory Committee for Educational Research he devoted much of his time and energy to the promotion of educational research and the development of graduate study in education. Dean Coutts and his colleagues recognized that there was need for communication among researchers and for the dissemination of research results; this leadership and continued support have made possible the publication of AJER over the past eighteen years. The Publications Committee and AJER staff join the many who have wished Dean Coutts well in whatever new career he chooses to pursue in his retirement.

.....

We are pleased to announce that Dr. John McLeish, Professor of Educational Psychology, has accepted the editorship of AJER. Although his duties commence July 1st officially, he has already been active over the past few months in making the necessary preparations for the September issue. Dr. McLeish came to The University of Alberta from Cambridge, England where he directed a five-year research project in the area of teacher education. He is the author of eight books (two at present in press) and a large number of research papers. His research interests range from musical ability in educationally subnormal children through students' attitudes to teaching methods, to superstitions of Canadian and British school children. Dr. McLeish has just completed a study of Alberta post-secondary, non-university students' motivations and needs. In addition to an impressive background of research and scholarship, Dr. McLeish also brings to the editorship two years of service as Chairman of the Faculty Publications Committee. It is evident that he is eminently qualified to assume his new responsibilities.

.....

I wish to thank the many people with whom I have been associated, either through correspondence or personally, during my term of office for their cooperation, patience, and understanding. Special thanks are due to the contributors who reacted so kindly to our critical comments on manuscripts, to the subscribers who remained loyal and to those who responded to our campaigns, to the members of editorial committees for their expert advice, and to the members of the Publications Committee for their guidance. The fact that AJER has been published at all during my term of office attests to the capable assistance of Mrs. K. Kinloch who served as secretary, to the patience of various members of The University of Alberta Printing Department, and to Mr. Alan Hellyer who has served as Assistant to the Editor for the past two years. As a result of their efforts a challenging task became a rewarding and enjoyable one for me.

Erwin Miklos
Editor

A. D. BOWD

Some Determinants of School Achievement in Several Indian Groups¹

This study examined the relative importance of vocabulary, general intelligence, language background and socioeconomic status in determining the grade level achieved by Indian boys aged 12-14 from several cultural groups in Western Canada. Accepting the distinction between present ability and educability for peoples undergoing acculturation, it was anticipated that while general intelligence would be a satisfactory predictor of achievement among white children, vocabulary and socioeconomic status would be most important for Indian groups. This expectation received general confirmation, and some implications for teachers of Indian children are discussed briefly. (Dr. Bowd is an Assistant Professor in the Department of Educational Psychology at The University of Manitoba.)

Studies of the educational achievement of Indian children, carried out for the most part in the United States, have consistently revealed grade retardation. Coombs et al. (1958) found the two best indicators of underachievement to be the degree of Indian ancestry and the child's pre-school language; they concluded, not surprisingly, that the more acculturated the child the better his chances of educational success. More recently the *National study of American Indian education* (Havighurst, 1970) pointed to economic disadvantage and social isolation from contemporary urban-industrial culture as the main causes of underachievement.

In this country, the *Survey of contemporary Indians of Canada* (Hawthorn, 1967) found that among three Indian communities of differing socioeconomic and cultural backgrounds in British Columbia, 80% of Indian children were retarded in grade one and that for all individuals examined the average age-grade retardation was 2.5 years. Despite cultural differences among the Indian communities, the almost universal socioeconomic disadvantage and associated limited verbal stimulation were claimed to limit drastically the success of Indian children at school.

¹ This study was supported financially by the Alberta Human Resources Research Council; the advice of Dr. P. E. Vernon is also gratefully acknowledged by the author.

In the sample examined by Hawthorn, only 28.5% of Indian workers were employed more than nine months of the year, while 61% were unemployed for more than six months of the year. In Canada for 1967, the Indian child at school was, on the average, retarded by two grade levels in comparison with the white population, and 27% of children dropped out of school by grade 8 (Indian Affairs Department, Education Division, 1969).

A concomitant of low socioeconomic status is limited verbal stimulation and feedback from adults in the formative years (Bernstein, 1961). Many Indian children suffer the further disadvantage of experiencing a conflict between their native language and that of the school. Bass and Burger (1967) suggest that language conflict may be the basis for the high failure and dropout rate of Indian children. Wax and Wax (1964) found that proficiency in English was essential for scholastic success among Indian children in the United States.

Several studies by MacArthur with Canadian Indian, Metis and Eskimo children have shown that certain "culture-reduced" tests of intelligence are useful predictors of educability among native people (MacArthur, 1968, 1969, 1970). Raven's Progressive Matrices test, in particular, was judged useful because it minimized the influence of specific information and skills while showing a substantial relationship with school achievement and other measures of intelligence (West and MacArthur, 1968).

Therefore, apart from cultural and motivational variables often specific to particular Indian groups, three pervading and quite general factors—socioeconomic status, language background and intelligence—have been consistently found to influence the educational achievement of Indian children. Even a cursory examination of the literature demonstrates that these same factors have been found to be of similar overall importance with respect to white children.

While these factors have at different times been related to Indians' educational achievement, there has been little comparative analysis of their relative importance in different groups. For example, it might be anticipated that verbal skills are more relevant to educational success in the elementary years, where so much learning is the result of verbal instruction, than the type of symbolic capacities assessed by Raven's Matrices. This may be particularly likely in so-called "culturally deprived" communities where language differences set the community apart from the larger society.

Problem

The principal expectation of the present study follows upon MacArthur's distinction between *present ability* and *educability* among Indian and Metis children (MacArthur, 1968). MacArthur points out that Raven's Matrices test, because it is less dependent upon extrinsic cultural and environmental variables, is a better predictor of potential achievement than traditional mental tests. It was anticipated that among white Canadian children this distinction would not obtain and that Raven's test would be a satisfactory predictor of present achievement or grade level. Among Indian and Metis students on the other hand, socioeconomic status and

vocabulary level are expected to be better indicators of present achievement. In particular, therefore, a high relationship between language background and grade level was anticipated in comparison with white children of a similar age.

The hypotheses which follow are based upon the assumption that when the influence of age is removed, educational achievement in the native groups will be determined primarily by verbal ability while in the white group general intelligence will be more important. The socioeconomic status of the family, judged in terms of paternal employment, is considered to be of greater consequence to the school performance of the native subjects because of its implications with regard to acculturation and the acceptance of Euro-Canadian values respecting work and education (Zentner, 1963). This distinction would not be expected to apply to the white subjects.

Use of English by Indian parents is considered an indication, to some extent, of their contact with white society and likely acceptance of white values regarding education. It is therefore likely to be of greater consequence regarding their children's overall school performance than is anticipated among white parents. For the same reason, the child's use of an Indian language is expected to relate negatively to grade level.

Hypotheses

That when the effects of age are removed:

1. Educational achievement in terms of grade level will correlate positively with Vocabulary and Paternal Employment in each native sample;
2. Grade level will correlate positively with Raven's Matrices in the white sample;
3. There will be no relationship between grade level and Vocabulary in the white sample;
4. There will be no relationship between grade level and Raven's Matrices in the native samples;
5. Parental use of English in the home will correlate positively with Vocabulary and grade level in the native groups;
6. The use of an Indian language by the child will correlate negatively with the grade level.

Design of the Study

Samples

The subjects selected were Indian and Metis boys aged between twelve and fourteen from four cultural groups in Western Canada, together with a sample of white boys of the same age from Calgary, Alberta.

All available boys in the age range were tested for each group except Calgary, and samples are considered representative of 12-14 year old boys for each community. The communities examined were chosen after consideration of the degree of white influence, so as to represent a considerable range of acculturation.

Bella Bella, British Columbia: 29 boys (mean age 12.7) ranging from grade 4 to grade 7 were tested. Situated 350 miles north of Vancouver

on a small coastal island, Bella Bella is relatively inaccessible and quite isolated from white influence. Fishing is the main industry, but unemployment is high for eight months of the year. Despite their geographical isolation the people of Bella Bella have all but lost their native language and little remains of their material culture.

Cluny, Alberta: 30 boys (mean age 13.1) from the Blackfoot Indian reserve. Cluny were tested. The grade range involved was 4 to 8. The Blackfoot reserve is situated about 65 miles east of Calgary on undulating short grass prairie country, the main surrounding industry being wheat and grain production. Unemployment is extreme, and despite their proximity to a major urban centre the Blackfoot language is the first language of nearly all children, many coming into initial contact with English at school.

Morley, Alberta: 36 boys from the Stony Indian reserve, Morley were tested. The mean age was 12.8 and the grade range involved was 4 to 7. Morley is situated 35 miles west of Calgary in the foothills of the Rocky mountains. There is some livestock raising and logging, but unemployment is very high and depressed living conditions are general. As at Cluny, the majority of children speak both English and the native language.

Lac la Biche, Alberta: 42 Metis boys attending public schools in Lac la Biche, 140 miles northeast of Edmonton, were tested. The mean age of the group was 13.2 years and boys from grade 4 to grade 8 were involved. In a sense this sample is transitional with respect to white acculturation, the Indian groups being more traditional. Although there tends to be more social contact with the white community, as with the Indian, unemployment and poverty are characteristic of Metis life. The Cree language is common among the Metis, but English tends to predominate.

Calgary, Alberta: 35 white boys attending a Calgary junior high school were tested. The grade levels involved were 7 and 8, the mean age being 12.9. The boys chosen came from a blue-collar neighborhood and may reasonably be assumed representative of white Canadian boys from a slightly lower than average socioeconomic level. It should be stressed that although socioeconomic differences were reduced somewhat by the choice of a working class group, they still remain substantial. A large number of the children came from recently immigrated families, and did not have English as their first language.

Tests

The subjects were administered the Standard Progressive Matrices (Raven, 1938) and the Mill Hill Vocabulary Scale, Junior Set A. The assessment of paternal employment and language background was, for practical reasons, carried out in terms of questionnaire items administered to the boys.

Partial correlations between all relevant variables were computed, the effects of age being eliminated. Significance was determined by employing the *t* test for significance of a partial correlation coefficient (Ferguson, 1966).

Results

While the unemployment figures reported in Table 1 are considered reasonably accurate indications of conditions prevailing at the time of testing, it should be noted that the Bella Bella figure is seasonal and that unemployment is very much higher during the winter months. The large number of non-English speaking parents among the Calgary sample are recent immigrants to Canada.

TABLE 1

DATA FOR FIVE SAMPLES ON RAVEN'S MATRICES, PARENTAL EMPLOYMENT, VOCABULARY, USE OF INDIAN LANGUAGE BY CHILDREN AND ENGLISH BY PARENTS, AND GRADE LEVEL

Sample	Raven's Test		Paternal Employment Percent	Vocabulary		Children's Indian Percent	Parents' English Percent	Grade	
	\bar{X}	SD		\bar{X}	SD			\bar{X}	SD
Calgary	38.29	9.91	89	17.17	3.12	—	69	7.26	.44
Lac la Biche	32.52	11.44	38	13.29	4.04	79	67	6.26	1.25
Cluny	34.53	7.78	27	9.53	4.59	90	23	6.37	1.30
Bella Bella	26.59	9.13	72	13.41	3.41	28	79	5.66	1.06
Morley	28.56	9.33	17	9.75	4.30	94	33	5.42	.83

The hypotheses concerning the correlates of grade level have received general confirmation in the data (Table 2).

Hypothesis 1, predicting a positive relationship with Vocabulary and Paternal Employment in each native sample, is confirmed in all cases for Vocabulary, and for two groups with regard to Paternal Employment. In the cases of Bella Bella and Morley correlations are positive but fail to achieve significance.

Grade level correlates highly with Raven's Matrices in the white sample, while failing to relate significantly with Vocabulary. Therefore hypotheses 2 and 3 are confirmed. However, the hypothesized independence of grade level and Raven's Matrices for the native samples, while accepted in three groups, is rejected for Lac la Biche.

As predicted then, grade level depends primarily upon general intelligence in the white sample, but upon verbal ability in the native samples. In the case of the Metis group, however, both these variables, together with paternal employment, are important correlates.

Hypothesis 5, that paternal use of English in the home will correlate positively with Vocabulary and grade level in the native groups, is confirmed for all groups except Morley where both coefficients are low and

non-significant (Table 3). The final hypothesis, that the use of an Indian language by the child will correlate negatively with grade level is rejected for all the groups studied.

TABLE 2

PARTIAL CORRELATION COEFFICIENTS (AGE ELIMINATED) FOR GRADE LEVEL, VOCABULARY, PARENTAL EMPLOYMENT AND RAVEN'S MATRICES TEST IN FIVE SAMPLES

Sample	Variable	Grade	Vocabulary	Paternal Employment
Calgary	Vocabulary	.228		
	Employment	.001	.204	
	Raven's Test	.476**	.303*	.281
Lac la Biche	Vocabulary	.690**		
	Employment	.455**	.485**	
	Raven's Test	.571**	.672**	.544**
Cluny	Vocabulary	.553**		
	Employment	.438*	.427*	
	Raven's Test	.235	.371*	.301
Bella Bella	Vocabulary	.648**		
	Employment	.318	.211	
	Raven's Test	.330	.069	.087
Morley	Vocabulary	.775**		
	Employment	.267	.376*	
	Raven's Test	.232	.349*	.421**

* significant at .05 level.

** significant at .01 level.

Discussion

The fact that Indian children tend to drop out of school more frequently and that they tend to be grade-retarded in comparison with white children is commonly attributed to the Indian child's background which is frequently described as "culturally deprived." The data presented in this study suggest that to some extent it is the school itself which determines that the Indian child will fail, that the criteria for success differ between white and Indian.

Irrespective of the diversity of cultural environment sampled, in all the native groups Vocabulary appears as the prime determinant of grade level. However, the Indian child has usually had less opportunity for the development of English language skills, and their use as a criterion for grade advancement penalizes him severely. Among the sample of white children studied, where many came from bilingual homes, it was general intelligence rather than verbal skills which determined grade level.

Clearly the language background of the Indian children studied is such that they have, on the average, developed poorer English vocabularies than the white children. The absence of significant correlations between

TABLE 3
PARTIAL CORRELATION COEFFICIENTS (AGE ELIMINATED) BETWEEN
LANGUAGE BACKGROUND AND VOCABULARY AND GRADE LEVEL IN
FOUR SAMPLES

Sample	Language	Vocabulary	Grade level
Lac la Biche	Parents' English	.344*	.273*
	Child's Indian	.142	.011
Cluny	Parents' English	.557**	.494**
	Child's Indian	-.131	-.243
Bella Bella	Parents' English	.638**	.345*
	Child's Indian	-.234	.084
Morley	Parents' English	.143	.034
	Child's Indian	-.195	.011

* significant at .05 level.
** significant at .01 level.

the child's use of an Indian language and grade level, together with the positive correlations with parental use of English suggests that inadequate exposure to English rather than the use of a native language is the principal reason for language problems at school.

The most apparent need of the Indian boys tested is for special training in the English language. It is not suggested that such training should be at the expense of the native language, but rather that intensive education in the use of English should be provided in the early years of elementary school, and that grade advancement should depend on skills other than verbal proficiency.

Vernon (1969) has noted that poor Indian performance in the "new math" may be attributed to the important verbal component inherent in its teaching. Many school subjects, particularly at the elementary level, are taught by verbal instruction and explanation, thus unfairly penalizing many Indian children. It is therefore suggested that more effective teaching strategies be adopted by teachers of Indian children. Kleinfeld (1970) for example, has suggested the use of Venn diagrams and other symbolic pictorial aids in teaching English language abstractions to Eskimo children. This principle might be extended to the teaching of other subjects, and generally more visually oriented techniques adopted.

References

Bass, W. P., & Burger, H. G. *American Indians and educational laboratories.* Albuquerque, N.M.: Southwest Cooperative Educational Laboratory, 1967. (ERIC: ED 014 369.)

- Bernstein, B. Aspects of language and learning in the genesis of social process. *Journal of Child Psychology and Psychiatry*, 1961, 1, 313-324.
- Coombs, L. M., Kron, R. E., Collister, E. G., & Anderson, K. E. *The Indian child goes to school: a study of interracial differences*. Washington, D.C.: U.S. Department of the Interior, Bureau of Indian Affairs, 1958.
- Education Branch, Social Services, Department of Indian Affairs and Northern Development. *A brief study of available statistical data on Indian pupil enrolment 1949-1969*. Ottawa: Queen's Printer, 1969.
- Ferguson, G. A. *Statistical analysis in psychology and education*. New York: McGraw-Hill, 2nd Ed., 1966.
- Havighurst, R. J. The education of Indian children and youth. *National study of American Indian education: Summary report and recommendations*, Series 4, no. 6, Washington, D.C.: U.S. Office of Education, Dec. 1970.
- Hawthorn, H. B. (Ed.). *A survey of the contemporary Indians of Canada*. Two volumes. Ottawa: Indian Affairs Branch, 1967.
- Kleinfeld, J. *Cognitive strengths of Eskimos and implications for education*. Fairbanks: Institute of Social, Economic and Government Research, University of Alaska. Occasional paper No. 3, 1970.
- MacArthur, R. S. Some differential abilities of northern Canadian native youth. *International Journal of Psychology*, 1968, 3, 43-51.
- MacArthur, R. S. Some cognitive abilities of Eskimo, White and Indian-Metis pupils aged 9-12 years. *Canadian Journal of Behavioural Science*, 1969, 1, 50-59.
- MacArthur, R. S. Cognition and psychosocial influences for Eastern Eskimos and Nsenga Africans: Some preliminaries. Unpublished paper presented at the Symposium on Cross-Cultural Research. The Institute for Human Relations, St. John's, Newfoundland, 1970.
- Vernon, P. E. *Intelligence and cultural environment*. London: Methuen, 1969.
- Wax, R. H., & Wax, M. L. *Dropout of American Indians at the secondary level*. Cooperative Research Project No. S-099. Atlanta: Emory University, 1964. (ERIC: ED 003 853.)
- West, L. W., & MacArthur, R. S. An evaluation of selected intelligence tests for two samples of Metis and Indian children. *Alberta Journal of Educational Research*, 1964, 10, 17-27.
- Zentner, H. Factors in the social pathology of a North American Indian society. *Anthropologica*, 1963, 5, 119-130.

R. C. CONKLIN

and

J. PHELPS

Differences Between Applicants and Enrollees in a Mature Non-Matriculant Program¹

Differences between applicants and those students who completed courses in a Mature Non-Matriculant (MNM) Program were examined at The University of Calgary. Six hundred and fifty-eight MNM applicants were divided into two groups: 337 who did not enrol and 321 who did enrol and were successful in three or more courses. The Cooperative Academic Ability Test (CAAT), and three subtests of the Iowa Tests of Educational Development (ITED) were administered to the subjects. Significant differences were found between the two groups on the CAAT as well as the ITED. In addition, applicants differed from enrollees on several relevant biographical variables. The results were interpreted as evidence of the need for well developed linguistic skills and personal "support" for successful MNM students. (Dr. Conklin is an Associate Professor of Educational Psychology at The University of Calgary; Mr. Phelps is a principal in the Brooks School Division, Brooks, Alberta.)

Problem

As evidenced by the increasing body of literature the dropout phenomenon has caused much concern among educators. In particular researchers have found a disturbingly high dropout rate for university students (Goetz & Leach, 1967; Iffert, 1958; Lindsay, Marks, & Hamel; and Summerskill, 1962). These researchers estimate attrition rates ranging from 50% to 67% over a normal four year college or university program. Most studies of this nature have been done using freshman college students and fewer studies have used mature adult students as subjects. Verner and Davis (1964) thoroughly reviewed the literature on adult dropouts and found that it was difficult to formulate valid conclusions from the research due to a lack of statistical verification in the majority of studies.

With an increasing emphasis on adult education at all levels the question of adult dropouts is also receiving increased attention (Mann,

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1966; Sainty, 1968). It is estimated that in the United States alone there are probably 30 to 50 million adults participating in educational activities. It is not certain what attrition rate is evidenced in adult student populations, but it is generally accepted that these students have a greater financial and psychological investment in their education. Whatever the dropout rate may be the reasons for it are complex and interwoven and therefore remain inconclusive.

For several years at the University of Calgary adults who have not gained the normal entrance requirements have been allowed entrance under the Mature Non-Matriculant (MNM) privilege. Under this privilege students must be at least 23 years of age and demonstrate a desire for further education. The plan has been a success as is evidenced by the numbers of students enrolled: 1967-68, 280; 1968-69, 460; 1969-70, 700+ (est.). In the Faculty of Education, for instance, one student in six is a MNM. In addition, throughout all faculties it is estimated that less than 10% of the MNM's are actual dropouts and failures; an attrition rate much lower than the normal 20 to 40% attrition for freshman students.

One aspect of the entrance procedure for MNM students is the completion of a battery of tests supervised by Student Counseling Services. Previous to the summer of 1969 test records for approximately 700 persons were collected. The tests required one full day of the individual's time and arrangements to write them had to be made by the individual himself, usually after one or two interviews with an appropriate dean's office. Of the 700 who went through the above procedure and who were accepted for entrance only half actually enrolled in a course or courses at the university. Those who did not enrol could be described as pre-enrolment dropouts. The purpose of this investigation was to compare these applicants with those who were successful on the battery of tests administered during the entrance procedures.

Method

During 1969-70 the test data available on 699 applicants to the MNM program were analyzed. The test data included the following:

1. The Iowa Test of Educational Development (ITED)
 - (a) Interpretation—Natural Sciences
 - (b) Interpretation—Social Sciences
 - (c) Interpretation—Literary Materials
2. The Cooperative Academic Ability Test (CAAT)
3. The Student Biographical Inventory

Of the three instruments the Student Biographical Inventory is the only nonstandardized one. It was constructed specifically to collect biographical information about MNM applicants. It is divided into seven sections which question the applicant on areas of work and social experience, educational experience, present plans and family data, personal characteristics, reading habits, additional applicant comments, and basic biographical data.

The total size of the sample was 699. These were further divided into three groups; (a) 337 applicants, (b) 321 successful enrollees, and (c) 41 persons who withdrew from their studies. This latter group may constitute

some failures and dropouts, but largely they are persons who take one year free from study and continue in a subsequent year. Because their status is not clear they were not included in the analysis for this report. Our sample then includes 658 MNM students—363 males and 295 females—ranging in age from 23 to 60. The 658 were then divided into the two groups mentioned above; 337 applicants and 321 enrollees. Scores on the ITED and CAAT were compared by testing the significance of the difference with a *t* test. In the case of biographical data the significance of the differences in percentage were compared.

Results

The results of the analyses for the ITED and CAAT tests appear in Table 1. The successful MNM students scored higher on the Verbal section of the CAAT, the total score of the CAAT, and on all three of the ITED tests. The only scale on which the successful students did not score higher was the Mathematical section of the CAAT.

TABLE 1
COMPARISON OF COMPLETIONS AND PRE-ENROLMENT DROP OUTS
ON CAAT AND ITED

Variable	Pre-enrolment		Completions		<i>t</i> Value	Significance
	Drop outs					
	Mean	S.D.	Mean	S.D.		
CAAT						
Verbal	29.07	8.38	32.40	8.31	5.11	<i>p</i> <.001
Mathematical	26.59	7.71	27.03	13.85	0.50	N.S.
Total	55.69	13.85	59.56	14.20	3.54	<i>p</i> <.001
ITED						
Social Sciences	50.72	14.68	56.25	13.39	4.87	<i>p</i> <.001
Natural Sciences	42.81	13.77	46.12	14.20	3.03	<i>p</i> <.01
Literary Materials	49.31	14.62	54.87	14.03	5.00	<i>p</i> <.001

Of the many biographical items, the following were the ones which differentiated significantly ($p < .001$) between the two groups of students.

1. Formal education beyond grade 12
2. Discontinuation of formal education because of low grades
3. Influence of friends and relations in selecting a particular field of study
4. Constant association with university people
5. Spouse with some university training
6. Spouse with professional type of occupation
7. Very supportive reaction by spouse regarding entrance to university.

Results of these items were positive indicators for the successful MNM. For example, they were more likely to have had education beyond grade 12 and were less likely to have discontinued high school because of poor grades. They were more influenced by friends and relatives and had more association with university people. Their spouses were more likely to have

had some university training as well as a professional type of occupation, and were more supportive to the university venture.

Discussion and Implications

It is interesting to speculate on the importance of linguistic ability as a differentiating variable with MNM students. It should be noted that the Natural Science and Social Studies subtests of the ITED are based on verbal ability. In an earlier examination of the problem it was found that the linguistic skills of the MNM students were relatively well developed as was evidenced by the fact that their scores on the linguistic test of the CAAT were approximately equal with full matriculated freshman students (Conklin, 1969). However, the same study revealed that their mathematical ability scores were much lower. It is a fact that a verbal facility has always been a necessity in most university programs and it is no surprise that about 76% of the MNM students enrol in the Faculties of Education and Arts and Science, both highly dependent on adequate verbal skills.

The fact that applicants who did not enrol scored lower on all tests measuring the linguistic factor may well mean that a self-selection procedure of a sort was in operation; that is, a MNM student who felt he did poorly on the tests may have decided to terminate his efforts at university. The reasoning may have been based on the presupposition that the tests, in fact, were representative of university work. On the other hand, those who had less difficulty with the tests may have been buoyed by the thought that their performance on the tests could be generalized to actual course work.

At any rate there is no doubt that MNM students with better developed linguistic skills are more likely to pursue university courses and be successful. Those with less well developed linguistic skills are more likely to be early dropouts.

The biographical data seem to indicate that MNM students who pursued high school to near completion or completion are better prospects for university at some future time. If they dropped out of a high school pattern it was not because poor grades were the greatest contributing factor. The remaining five items could be framed into a "support" hypothesis. It seems that the MNM requires a great deal of encouragement and support. Those who benefit from the support of friends, family, and relatives are more likely to be successful students. Peavy (1968), in a study of mental health problems of students, found that older students suffered mentally more often if they did not receive full support for their educational undertaking from their spouses.

As a result of the findings in the present study it seems reasonable to suggest that verbal ability tests (including reading tests) be used as screening devices for entering adult students. Where possible remedial reading programs and other methods of upgrading verbal skills should be offered as non-credit prerequisite courses to a university or college program. When a student achieved a certain level of competency he could then be admitted into a degree program thus eliminating the waste in human resources of the consequences of dropping out.

In addition to the above kinds of programs, colleges and universities should also offer "orientation programs" for the purpose of desensitizing and familiarizing the MNM applicant to the university milieu. Group counseling and discussion sessions could be held prior to enrolment. These could involve the spouse to ensure the possibility that inhibiting attitudes could be changed.

Although adult students are usually more "mature" and have adequate vocational goals already established, we, as educators, should not fall into the trap of thinking they do not need constant support and encouragement. They may need far more than their freshman counterparts.

References

- Conklin, R. C. Facts and figures concerning mature non-matriculant students at the University of Calgary. *Student Counseling Research Bulletin*, 1969, 3.
- Goetz, W., & Leach, D. The disappearing student. *Personnel and Guidance Journal*, 1967, 45, 883-887.
- Iffert, R. E. Retention and withdrawal of college students. *U.S. Department of Health, Education, and Welfare Bulletin*, 1958, No. 1.
- Lindsay, C. A., Marks, E., & Hamel, L. S. Native and transfer baccalaureate students. *Journal of College Student Personnel*, 1966, 7, 5-13.
- Mann, W. E. Adult drop-outs. *Continuous Learning*, 1966, 5, 55-65; 127-143.
- Peavy, R. V. Mental health crises of university students. *Canada's Mental Health*, 1968, 16, 15-17.
- Sainty, G. E. Some predictors of success in a course for academic upgrading of adults at a Canadian Vocational Training Centre. Unpublished master's thesis, University of Calgary, 1968.
- Summerskill, J. Drop-outs from college. In N. Sanford (Ed.), *The American College*. New York: Wiley, 1962, 627-657.
- Verner, C., & Davis, G. S. Junior completions and drop-outs: A review of research. *Adult Education*, 1964, 14, 157-175.

V. K. CORFIELD

Programmed Instruction as a Tool to Facilitate Perception of Alternatives¹

A program was devised for a teaching machine in an attempt to increase the ability of subjects to perceive alternatives in their environment. Stage I of the program utilized geometric figures varying in color, size, shape, and direction. Subjects were asked to group each array of six according to a common attribute and to specify as many such groupings as possible. Results indicated a significant increase in scores on an object sorting test for subjects who experienced the program; no such increase was evidenced by control subjects. In Stage II verbal statements were presented and subjects asked to list as many alternative meanings which could be attributed to the statement as possible. A significant increase in the number of alternatives perceived was evidenced on post-testing by subjects exposed to the program as compared to control subjects. (Dr. Corfield is an Associate Professor in the Department of Psychology at The University of Calgary.)

Haygood and Bourne (1965) have argued that the development of rules to guide one's behavior is preceded by the identification of attributes relevant to the evolving rule. In short, one attends to a variety of information before developing a concept or label. Other researchers have studied the process by which one obtains the requisite information. Many investigators have been particularly interested in the characteristically stable way in which a person functions over a range of situations. These consistent tendencies have been variously referred to as "rigidity," "dogmatism," "internal-external control," "field-dependence," and "conceptual structure."

Brown (1953) found that in an ego-involving situation, high scorers on the F scale were more likely to display rigid patterns of behavior which in turn interfered with their ability to solve complex problems. Rokeach (1960) differentiated people on the basis of the dogmatism of their beliefs. Rotter (1954) proposed that individuals develop expectancies that reinforcements are the result of their own actions (internal control) or are due to some external agent over which they have little control.

¹ This project was supported by a grant from the Alberta Human Resources Research Council.

Witkin (1965) reported that people showed consistent ways of functioning in their perceptual and intellectual activities. Field dependent individuals tended to be influenced by the field as perceived by them, whereas field independent individuals were able to make judgments independently of the field.

According to Harvey, Hunt, and Schroder (1961), and Schroder, Driver, and Streufert (1967), cognitive structure determines the kind and diversity of information an individual is capable of generating about his environment and the number of different ways he can organize and integrate that information. The contention is that informational input, evaluation of information, and reactions to that information are dependent on the cognitive structure of the individual.

These authors have proposed that people can be categorized as functioning at four levels of conceptual complexity. Persons functioning at the lowest level, designated as concrete, tend to lack organizational rules for establishing relationships among dimensions. As a result, thinking is categorical and is not open to conflicting information especially under conditions of conflict. Some of the available information may be excluded and external anchors are relied upon for guidance. At the highest level of complexity, abstract functioning permits integration of dimensions. Such persons base judgments on internal standards, which are constantly under revision as new information is experienced.

It is possible that those persons who are functioning at a concrete level may experience difficulty functioning adequately in social situations because of their inability to perceive alternatives. Not only may they categorically perceive the responses of others, but they may have a limited range of responses available for their use. Thus social interaction would likely be limited in effectiveness. Furthermore, dependence on external standards would make them vulnerable to control by others.

The present study was undertaken in the belief that perception of alternatives can be taught. Programmed instruction has been used to teach a wide variety of academic subjects and also to help those requiring special education. To date little work has been done with respect to programmed instruction in the field of social learning. Cohoon (1967) developed a program relative to applying for a job which was found to be a useful aid in counselling. Cogswell and Estavan (1965) have devised a program which performs some of the functions of a school counsellor. Programmed instruction in the area of social learning has received little attention.

The purpose of this project was to devise a program for a teaching machine which would increase the ability of subjects to perceive alternatives in their environment and to facilitate the integration of dimensions. As a first step in this process the task chosen was a concept formation task. It was hypothesized that the number and diversity of concepts attained after exposure to the program would increase significantly compared to the number achieved by those who did not have the opportunity for this learning experience.

A second stage involved the presentation of verbal statements to which subjects were asked to list as many interpretations as possible. It was

hypothesized that the number of alternative meanings attributed to a statement would increase significantly after exposure to the program but that such an increase would not be evidenced by those who did not experience the program.

STAGE I

Method

Subjects

Since a heterogeneous group of subjects was considered desirable for testing, visitors to the University of Calgary Open House were asked to participate. Fourteen female and fourteen male subjects took part. Seven subjects of each sex were randomly assigned to the experimental and control groups. Ages ranged from 11 to 21 years with an average age of 15.5 years. School grade ranged from Grade 6 to first year university, the median grade being Grade 10.

Materials

A program for the MTA 100 Scholar (Modern Teaching Associates) was prepared. The program consisted of a series of 18, 35 mm color slides. Each slide presented a 2 x 3 array of geometric forms in a variety of sizes, shapes and colors. Early in the series the array was composed of figures of approximately equal size but in two or three colors. The task of subjects was to arrange the figures into two groups of three figures each on the basis of a common attribute. For example, an array might be grouped: red circle, red square, red triangle/blue circle, blue square, blue triangle. These two groups would be based upon common color. The same figures could also be exhaustively grouped on the basis of shape, but in this instance three groupings would be required.

As the series progressed, each of the groupings contained geometric figures of three different sizes, three different colors and a variety of rotations in space. Arrays were arranged so that a number of correct answers were possible. For example, the final array could be partitioned on the basis of color, direction, size and shape.

A printed program was prepared to accompany the slides. The program directed the subject to exhaustively group the figures in the array into two groups of three figures or, on some trials, into three groups of two figures. Following each grouping the subject could obtain from the program a designation of the attribute (size, color, shape or direction) which could have been the basis of the grouping. The subject was urged to find as many groupings as possible in the array.

Synchronization features of the MTA 100 Scholar permitted automatic presentation of the slides on a Kodak Carousel 700 projector onto a rear view micrascreen. The program included one linear branch. No attempt was made to control step size.

To summarize, each subject was required to identify or discover the relevant attributes in the array, and to group the figures in the array on that basis.

The Goldstein-Scheerer Object Sorting Test (Goldstein & Scheerer, 1941)

was used for pre- and post-testing. The test consists of a selection of everyday objects (spoon, cigar, candle, plate, apple, nails, etc.). Among the objects there exist communalities of utility, material, color, form, size, texture, shape, and weight. Each subject was asked to examine the objects as they were spread before him and to group them on the basis of similarities or differences. The test score was the number of attributes used to group the objects.

Procedure

The experimental condition required subjects to do the Object Sorting Test, then work through the program, and finally to do the Object Sorting Test a second time. Pre-testing was conducted immediately prior to experience with the program and post-testing immediately following. Control group subjects did the pre- and post-test but spent about 30 minutes between the two looking at other displays in the building instead of working through the program.

Results

The results of *t* tests on pre- to post-test scores for the experimental and control groups are presented in Table 1. A significant increase from the pre-test score to the post-test score occurred for the group exposed to the program but not for the control group.

TABLE 1

MEANS, STANDARD DEVIATIONS, AND *t* TESTS FOR PRE- AND POST-TEST SCORES ON OBJECT SORTING TEST

Measure	Conditions			
	Experimental		Control	
	Mean	S.D.	Mean	S.D.
Pre-Test	3.429	1.555	3.857	1.231
Post-Test	5.000	1.414	4.714	1.589
<i>t</i>	2.695*		1.537	

* *p* <.02 two-tailed test

While some increase on post-test scores was evidenced in the control group as a result of test sensitivity, the amount of change was not sufficient to account for the differences found in the experimental condition.

Additional analyses were performed to investigate the relationship between scores obtained and other variables. Sex differences on the Object Sorting pre-test were studied by grouping males and females across the experimental and control conditions. The resultant *t* = 0.778 was not significant. The correlation coefficients between age and pre-test scores, and school grade and pre-test scores were 0.30 and 0.16 respectively. Both are below acceptable levels of significance.

Analysis of Slide Effectiveness

An additional 14 subjects worked with the program. The program used 18 slides and had a potential 27 responses since some of the arrays could be grouped on the basis of more than one attribute. The answer sheets of all subjects who experienced the program were scored and each of the 27 responses item analyzed. Each subject's response to each item was categorized true, false, or omitted. The point biserial correlation indicated the extent to which each item was grouped correctly with respect to the success each subject had with the program. In this way it was possible to reject four slides which appeared to lack discriminatory power. The length of the program could thus be reduced by about 22 percent without reducing effectiveness.

Discussion

The results obtained from testing the program indicated that people can be influenced in terms of their mode of information-seeking or attending.

Those persons who experienced the program had a higher probability of increasing their pre- to post-test score. The program had its intended effect without confounding effects of test sensitivity, age, school grade, or sex of the subject.

STAGE II

Method

Subjects

Visitors to the University of Calgary Open House were asked to participate in this experiment. Twenty males and twenty females were randomly assigned to the experimental and control groups with ten subjects of each sex in each group. Ages ranged from 13 to 27 years, with a mean age of 19.4 years.

Materials

As a first step in constructing a program, thirty brief statements were tape recorded and presented to 22 university students. Subjects were asked to list all the meanings which could be attributed to the statement. They were instructed not to list the different kinds of contexts in which the statement could occur, but rather to list the alternative meanings the speaker might have intended when the statement was made. Six statements from this original pool were selected for inclusion in the program. They included three male and three female voices. Statements were chosen on the basis of their ability to generate varied associations and responses on the part of subjects. Hence those with the highest mean response frequency were included. Examples of the kinds of statements used are, "It doesn't matter to him." and, "I know that."

A program for the MTA 100 Scholar (Modern Teaching Associates) was prepared. The six pre-tested statements were presented one at a time using a Cousino Synchro-Repeater which provides tape control of pacing. The printed program instructed subjects to respond to each verbal statement in terms of as many alternative meanings as possible. After each

presentation the program provided a list of acceptable interpretations. The subject was directed to proceed to the next statement and encouraged again to think of alternative meanings the statement might have. The program included one linear branch. No attempt was made to control step size.

Four additional statements were selected from the original pool for the purpose of pre- and post-testing. These four statements were further pre-tested using 87 university students to determine if they were similar with respect to their ability to generate responses, and to establish response frequencies. The two statements used for pre-testing had a combined mean of 3.29. The mean response frequency for the two statements used for post-testing was 3.04. One male and one female voice was used in each.

Procedure

Subjects were given the following instructions to read before responding to the two pre-test statements:

PLEASE READ THROUGH THESE INSTRUCTIONS
BEFORE BEGINNING

First, you are to turn the recorder on and listen to the first statement carefully. Then turn the recorder to stop. You may hear the statement only once.

On the sheet provided list *all* of the meanings which could be attributed to the first statement. Do *not* list different kinds of contexts in which the statement could occur. Rather, list the alternative meanings the speaker might have intended when he made the statement. Since you have no knowledge of the situation in which the statement was made, pretend you have overheard only the one remark. See how many meanings you can think of that the statement could have.

Here is an illustration. The statement, "That was funny," could have the intended meaning that something was:

1. amusing
2. strange
3. inconsistent
- or indicate 4. sarcasm
5. wonder, questioning
6. disbelief

and so on.

After listing your alternatives, turn the recorder back on and listen to statement No. 2. Turn the recorder to stop, and list all of the different meanings which you think this statement could have. Again ignore the situational context in which the statement might occur. Focus your thinking on the possible alternative meanings the speaker could have intended to convey.

Subjects in the experimental condition completed the pre-test, then worked through the program prepared for the MTA 100 Scholar, and immediately after completed the post-test. Control subjects did the pre-test, spent about 20 minutes looking at other displays, and then completed the post-test statements.

Results

A *t* test analysis was carried out to test the significance of differences found. The results of this analysis are shown in Table 2. Differences on post-test scores between the experimental and control groups were highly significant ($t = 3.556$, $df=38$, $p < .001$, 2 tail). No differences between groups existed on pre-test scores ($t = 0.684$, $df=38$). Pre- and Post-test difference scores also revealed a highly significant difference between the experimental and control groups. ($t = 3.987$, $df = 38$, $p < .001$, 2 tail). These differences held for both male and female subjects. While female subjects increased their scores slightly more than males after exposure to the program the amount of difference was not significant.

TABLE 2
MEANS, STANDARD DEVIATIONS, AND *t* TESTS FOR POST-TEST
SCORES AND DIFFERENCE SCORES FOR EXPERIMENTAL AND
CONTROL GROUPS

		Conditions						
Measure	Ss	Experimental			Control			t
		N	Mean	S.D.	N	Mean	S.D.	
Post-test	All Ss	20	6.300	3.568	20	3.525	3.320	3.556***
Difference	Males	10	2.350	3.215	10	.150	1.375	2.145*
Score (Post-	Females	10	3.000	2.906	10	.800	1.975	3.244**
less Pre-test								
Score)	All Ss	20	2.675	3.001	20	.475	1.690	3.987***

* $p < .05$ two-tailed

** $p < .01$ two-tailed

*** $p < .001$ two-tailed

Not only was the amount of change greater in the experimental group as compared to the control, but also the number of subjects who showed improvement was significantly greater. A chi square test on the number of subjects in each group who showed improvement on the post-test as compared to the pre-test, and those who either showed no change or a lower score on post-testing was significant at the five percent level. The observed and expected frequencies are shown in Table 3.

Discussion

The results obtained from testing this program indicated that people can learn to perceive more alternatives in their social environment than they did before this kind of experience.

It could be argued that the program had the effect of establishing a set for viewing available cues. Provided the set is generalized to other situations, learning such a set would be a highly desirable outcome.

Whether or not the increased ability to perceive alternatives of subjects who experience such a program would be generalized to situations related to their day-to-day lives remains an open question. It is hoped that additional work to assess generalizability will be possible.

TABLE 3
CHI SQUARE TEST ON SUBJECTS SHOWING IMPROVEMENT AND NO IMPROVEMENT IN THE EXPERIMENTAL AND CONTROL GROUPS

Improvement	Conditions				Total
	Experimental		Control		
	Observed	Expected	Observed	Expected	
Improved	16	12.5	9	12.5	25
No improvement	4	7.5	11	7.5	15
Total	20	20	20	20	40

$X^2 = 5.226, df = 1, p < .05$

Since no information was available regarding the conceptual structure of those who participated, no conclusions can be drawn at this time regarding the ability of such a program to increase the information-seeking and integrative ability of persons functioning at a concrete level. Using a test of cognitive structure before and after experiencing the entire program, is a desirable next step in testing the basic hypothesis that individuals functioning at a concrete level of complexity can be taught to perceive alternatives in their environment.

This attempt to teach directly the perception of alternatives suggests that people can learn to seek more information in a situation and integrate it in a meaningful way. Thus persons who approach situations in a rigid or concrete fashion may be able to learn greater flexibility by becoming aware that many situations can be perceived in more than one way. The result of exposure to such a program may help such persons to realize that their own approach should be open to revision or, at least, may make the acquisition and integration of new information more likely. It is hoped that further work with programmed instruction will add needed additional evidence.

References

Brown, R. A determinant of the relationship between rigidity and authoritarianism. *Journal of Abnormal & Social Psychology*, 1953, 48, 469-476.

Cogswell, J. F., & Estavan, D. P. *Explorations in computer-assisted counselling*, Santa Monica: SDC, 1965.

- Cohoon, D. D. An experimental programmed adjunct to counselling: Applying for a job. *Journal of Clinical Psychology*, 1967, 23, 62-67.
- Goldstein, K., & Sheerer, M. Abstract and concrete behavior: An experimental study with special tests. *Psychological Monographs*, 1941, 53, 239.
- Harvey, O. J., Hunt, D. E., & Schroder, M. *Conceptual systems and personality organization*. New York: John Wiley & Sons, Inc., 1961.
- Haygood, R. C., & Bourne, L. E. Attribute and rule learning aspects of conceptual behavior. Behavior research laboratory report No. 51, University of Colorado, 1965.
- Rokeach, M. *The open and closed mind*. New York: Basic Books, 1960.
- Rotter, J. B. *Social learning and clinical psychology*. Englewood Cliffs, N.J.: Prentice-Hall, 1954.
- Schroder, H., Driver, M., & Streufer, S. *Human information processing*. Toronto: Holt, Rinehart & Winston, 1967.
- Witkin, H. A. Psychological differentiation and forms of pathology. *Journal of Abnormal Psychology*, 1965, 70, 317-336.

D. FRIESEN

Variations in Perceptions of Organizational Climate

Much has been written and spoken about open climate in public schools; however, almost all research to date has focused on the teacher level or higher. This study made an assessment of openness as viewed by administrators, teachers, and students. The perceptions of climate by the three groups were compared in two schools: one open campus school and one traditionally organized school. It was concluded that student perceptions of open climate do not necessarily follow from administrator or teacher perceptions of openness in school climate. (Dr. Friesen is a Professor of Educational Administration at The University of Alberta.)

New forms of school organization are receiving much attention these days. Particularly popular has been the concept of the "open climate" in high schools. Certain schools are pictured as models of innovation for their efforts at removing restrictions and rules from their organizations. Students in these schools are experiencing a new freedom to determine their own behavior in most activities related to their social life, and to develop new characteristics of social relationships with other members of the school organization. These schools are said to exhibit an open climate.

Miklos (1965) in reviewing theory and research described the climate of an organization as referring to the "characteristics of certain social relationships which exist among the members of an organization and between the total organization and its participants." Research in schools that resulted from the use of such a definition of climate, particularly that of Halpin and Croft (1963), Andrews (1965), and Stryde (1966), focused mainly on the participants at the teacher level and higher. The newer forms of school organization have extended the concept of climate to include students as well as teachers. Thus in recent years schools have been described as "open" if students have had considerable freedom in making choices (Friesen, 1970).

The writer recently directed a series of studies designed to examine the meaning and impact of the open climate on members of school organizations (Bevan, Marshall, Marsh, 1970). One area of the studies, focusing on the perception of organization members, was based on the assumption that if an "open" and a "closed" school were compared on this concept a significant difference in perception of climate at all levels of the organizational structure would be revealed. Not only the higher participants would perceive greater openness but also the lower participants. Lower participants included students and teachers, according to the classification advanced by Etzioni (1961).

The "open" and "closed" designations for schools were those obtained from a number of sources to describe the schools. The climate on which these schools were compared was based on the work of Halpin and Croft (1963) and obtained by the administration of their Organizational Climate Description Questionnaire (OCDQ). The OCDQ was used in its regular form with teachers, and in an adapted form with students (Marsh, 1970).

Rationale and Hypotheses

A school classified as "open" would exhibit a number of characteristics different from those of a school classified as "closed." It would be a lively organization with leadership behavior emanating from all levels. Social needs would be satisfied more frequently. Interactions would be more genuine and authentic, with spontaneity and freedom. If "openness" exists in the school it seems reasonable to assume that the authenticity of freer relationships would pervade the administration-pupil and the teacher-pupil interactions. Further, it seems reasonable to assume that the pupils in an "open" school would sense this openness just as other members of the organization, as well as those people outside the organization who attach the label of openness to the school.

The present study set out to test this last assumption: students, teachers, and administrators of a school classified as "open" will all perceive their school as having a more open climate than the students, teachers, and administrators of a school classified as "closed." In addition, it seemed a reasonable assumption that significant differences in OCDQ subtest scores would be obtained between the two-schools, and this at all levels of the school organization.

H. 1: Teachers in a school classified as "open" perceive a significantly more open climate in their school than those in a school classified as "closed."

H. 2: Significant differences in mean OCDQ subtest scores exist between teachers in a school classified as "closed."

H. 3: Students in a school classified as "open" will perceive a significantly more open climate in their school than those in a school classified as "closed."

H. 4: Significant differences in mean OCDQ (adapted) and subtest scores exist between students in a school classified as "open" and those in a school classified as "closed."

Methodology

Instrumentation

School Climate Questionnaire. The SCQ, developed by Bevan (1970), is a 14-item instrument designed to measure the degree of openness of a high school. It is completed by the administrators of a school. Responses to each item are scored on a four-point scale and scored from one (no students) to four (all students). The fourteen items deal with student activities of the following nature: leaving school premises during school hours without special permission, leaving school after the last class, using study periods at their own discretion, dressing as they like, attending classes on a voluntary basis, smoking in special rooms or on school grounds, and electing a school program of their own choice. The principal responds with the category which best describes his school's official policy in relation to student autonomy. The higher the overall score, the more open the principal sees his school.

The Organizational Climate Description Questionnaire. The OCDQ is an instrument containing 64 Likert-type items. Eight subtest have been isolated from the responses, as well as a score of openness of climate. Teachers are the respondents to this questionnaire. Numerous studies have provided support for the validity and reliability of the eight subtests of the OCDQ, however, the classification of schools into the six climates suggested by Halpin and Croft has not been supported well. Halpin and Croft (1963) are much more confident about the ranking at each end of the continuum which they suggest. This study makes use of the subtest scores and the openness scores only. The higher the score on the openness dimension the more open is the climate.

The openness score for this study was derived by means of the formula employed by Appleberry and Hoy (1969). The openness score "is found by summing the school's scores on the Esprit and Thrust subtests, then subtracting the school's score on the Disengagement subtest."

The OCDQ was adapted for student use in a pilot study. The items were revised to reflect not the teacher-principal interactions, but the student-teacher interaction. Factor analytic methods were employed to check the success of the transformation. Several items that failed to load on the factor predicted were further revised. This adapted version of the OCDQ was used in the study (Marsh, 1970).

In addition to the above two instruments, a rating scale on openness of climate was used with the principals, and with a panel of judges. The principals were also asked to rank their own schools from high through average to well below average on a seven-point scale. The panel of judges ranked the nine high schools in the study on the basis of openness.

The Sample

Nine high schools (grades 10-12) in a large urban system were included in the initial stages of the study. They represented all but two of the high schools in the city; the two that were not included were special schools. The principals completed the SCQ and the special ranking form.

After the schools had been ranked from high to low, on the basis of the principals' scores on the SCQ, the two with the highest rating on openness were declared "open," and those two with the lowest as "closed." One "open" school labeled School B in this report and one "closed" school labeled School A were targets for the research.

Thirty teachers selected at random from each school were asked to complete the OCDQ. Twenty-six from School A and twenty-seven from School B returned completed questionnaires. Six classes of students in grades ten and eleven were randomly selected from School A and seven classes from School B. As a result 180 completed student questionnaires were obtained from School A, and 183 from School B. The data for the sample are provided in Table 1.

TABLE 1
NUMBER OF COMPLETED TEACHER AND STUDENT QUESTIONNAIRES

Respondents	School A (Closed)	School B (Open)
Teachers	26	27
Students	180	183

Four steps were followed in the investigation:

(1) A panel of educators was canvassed to rank the nine schools on openness. The panel consisted of administrators and teachers who were not employed in the schools studied and professors.

(2) The principal of each school was asked to rate his school on the openness dimensions from high to well below average. Each principal also completed the SCQ.

(3) The teachers in the sample completed the OCDQ.

(4) The students in the sample completed the adapted version of the OCDQ.

Analysis of variance was used to test the hypotheses. An alpha level of .05 was considered as indicating a significant difference between groups.

Results

The panel of judges, the principals' scores on the SCQ, and the principals' ranking of the openness of their own schools all indicated that School A was toward the closed end of the climate continuum and School B toward the open end. The principals' scores are provided in Table 2.

In no case did a principal rank his school as below average on openness. However, in this ranking, the principals of the open schools ranked their schools high in openness, while those in closed schools ranked theirs as average.

Hypothesis 1 predicted that teachers in the two schools will differ in their perception of openness in climate. Table 3 provides a summary of the analysis.

TABLE 2
SCORES OF NINE URBAN HIGH SCHOOLS ON THE
OPENNESS DIMENSION OF SCHOOL CLIMATE:
PRINCIPALS' EVALUATION

School	Openness Dimension Score (minimum = 14, maximum = 56)	Designation
1	56	Open
2	47	
3	43	
4	42	
5	42	
6	39	
7	37	
8	30	Closed
9	19	

TABLE 3
ANALYSIS OF VARIANCE OF THE DEGREE OF
OPENNESS PERCEIVED BY THE TEACHERS

Group	N	Mean
School A	26	0.88
School B	27	1.64
$F = 7.85$		$p = .007$

The hypothesis was supported. The school classified as open by administrators and outsiders was considered open by teachers, as well.

Hypothesis 2 predicted significant differences between the teachers of the two schools on the eight subtests of the OCDQ. Table 4 provides a summary of the findings related to this hypothesis.

The hypothesis was supported on five of the eight subtests. Of particular significance may be the findings that four of these five subtests relate to principal-teacher relationships: aloofness, production emphasis, thrust, and consideration.

Thrust and consideration were rated higher by teachers in the open school than by teachers in the closed school. Aloofness and production emphasis were rated higher by teachers in the closed school.

TABLE 4
ANALYSIS OF VARIANCE OF TEACHER SCORES
ON OCDQ SUBTESTS BETWEEN SCHOOLS

OCDQ Subtests	Significance Level of <i>F</i>	Hypothesis Accepted
Disengagement	.153	No
Hindrance	.286	No
Esprit	.556	No
Intimacy	.041	Yes
Aloofness	.039	Yes
Production Emphasis	.005	Yes
Thrust	.001	Yes
Consideration	.016	Yes

The third hypothesis predicted that students in the two schools would perceive a significant difference in the openness dimension. Table 5 presents the summary of the analysis.

The hypothesis was not upheld. There was no significant difference in the mean scores of students on openness between the two schools.

TABLE 5
ANALYSIS OF VARIANCE OF STUDENT PERCEPTION
OF OPENNESS BY SCHOOLS

Group	A	Mean
School A	180	3.24
School B	183	3.17
<i>F</i> = 0.32		<i>p</i> = .569

The fourth hypothesis postulated a significant difference between the two schools on the student OCDQ subtest scores. Table 6 provides the information of the analysis.

Support for the hypothesis was limited; only two of the eight subtests, disengagement and aloofness, showed a difference in perception of students in the two schools. They were both lower in the open school, B.

Discussion

The findings in this study tend to support the following generalizations. A school that was considered to have a more open climate by experts and principals was also perceived to be more open by the teachers in that school. However, students in the open school did not perceive a difference in openness from students in a school classified as closed.

TABLE 6
ANALYSIS OF VARIANCE OF STUDENT
SCORES ON OCDQ SUBTESTS BY SCHOOLS

OCDQ Subtests	Significance Level of <i>F</i>	Hypothesis Accepted
Disengagement	.044	Yes
Hindrance	.379	No
Esprit	.800	No
Intimacy	.244	No
Aloofness	.002	Yes
Production Emphasis	.810	No
Thrust	.350	No
Consideration	.192	No

The teachers of the two schools differed in their perceptions on five of the OCDQ subtests, the students differed in two. Teachers in the open school rated thrust, consideration and intimacy higher; aloofness and production emphasis lower than the teachers in the closed school. The students in the open school rated disengagement and aloofness lower than those in the closed school.

It may be that the findings relating to the teacher subtest scores lend credence to the overall result. Four of the five differences on mean subtest scores dealt with the teacher-principal relationship, and only one with the teacher-staff interaction. The openness dimension of the open school may be of administrative origin, making its impact on the staff, but hardly changing the staff situation itself.

Further the openness innovation seems to have faltered before reaching the students in the schools. However, the students in the open school indicated that they perceived less disengagement and aloofness in their school than the students in the closed school. This may indicate a beginning recognition of change in climate by the students.

Implications

1. In more general terms this study suggests that members at different levels of the school organization may view the climate of the organization in different ways. Questions could be raised as to which level of the hierarchy perceives most accurately the climate of the school. The educator or administrator might also question which level of the organizational structure should be studied to obtain the most meaningful interpretation of school climate. Is a school really open if the students in it perceive no difference in climate from that perceived by students in a closed school? For the administrator the key question may be that of deciding for whom openness is to be attained.

2. From all accounts the innovation of openness in the one school was introduced by the administration. This raises interesting questions relating to the introduction and implementation of innovations. For instance, how

could the administrators assist in the diffusion of the innovation through the whole school? Where should the innovation be introduced? What kinds of involvement of various members of the school organization would assist in maximum implementation? Who should be involved in the introduction of an innovation, and in what manner?

3. The difference in perceptions between the three levels in the schools studied hints at a differential impact of the innovation on climate. An interesting speculation is that changes in various subtests of climate may indicate the beginning of a change in perception of climate. In this study the principals were convinced that the schools differed on openness, the teachers were also convinced, but the students were not. Yet the students admitted to a difference in aloofness and disengagement. The OCDQ subtests may provide the more significant information.

4. Further research on the subtests could be carried out, especially how these relate to the openness dimension. In replications of this study several questions beg for attention. First, the adapted student version of the OCDQ needs further refinement. Second, a series of schools ranging from open to closed could be studied at the three organizational levels and the hypotheses tested on the resulting data. Third, the openness score should be calculated on the formula used in this study together with that used in the original OCDQ studies. More important than all of this is the question of the validity of the measures obtained and the validity of their comparisons.

Finally the question remained. For whom is the open climate designed, for administrators, teachers or students? How is it related to productivity? What kind of school climate or "personality" is conducive to adequate program planning? What alternatives exist for implementing a climate with a positive impact on program development? For such a climate to make a difference should it permeate the whole school so that the students "feel" it, or perceive it as well as teachers and administrators?

On the evidence of this study, it is possible to conjecture that the conditions suggested as prerequisite for effective program development (Miklos, 1965) have been partly achieved in the open school at the teacher level but not at the student level.

References

- Andrews, John. School organizational climate: Some validity studies. *Canadian Education and Research Digest*, 1965, 5, 317-334.
- Appleberry, James B., & Hoy, Wayne K. The pupil control ideology of professional personnel in 'open' and 'closed' elementary schools. *Educational Administration Quarterly*, 1969, 5, 74-85.
- Bevan, George. An empirical study of the need for independence in high school students. Unpublished doctoral dissertation, The University of Alberta, Edmonton, 1970.
- Etzioni, A. *A comparative analysis of complex organizations*. Glencoe Ill.: The Free Press, 1961.
- Friesen, D. Open campus—a rationale. *The Canadian Administrator*, 1970, 10(2).

- Halpin, Andrew W. & Croft, Don B. *The organizational climate of schools*. Chicago: Midwest Administration Center, University of Chicago, 1963.
- Marsh, William Leon. Teacher and student perceptions of school climate. Unpublished master's thesis, The University of Alberta, Edmonton, 1970.
- Marshall, George Narin. In a climate of freedom: a case study of an open campus composite high school. Unpublished master's thesis, The University of Alberta, Edmonton, 1970.
- Miklos, Erwin. School climate and program development. *The Canadian Administrator*, 1965, 4(7).
- Stryde, Sherman James. Relationships between the perceptions of the organizational climates of schools held by principals and by members of the teaching staffs. Unpublished master's thesis, The University of Alberta, 1966.

E. S. HICKCOX

and

D. J. DUCHARME

Administrative Staffing Patterns in Ontario School Districts

Characteristics of organization structure, administrator to student ratios, program integration, accountability flow, and decision-making were studied in 63 Ontario public school districts. Four categories of structure based on functions assigned to superintendents were identified: pure area, tiered, combination, and functional. Almost one-third of the boards in the sample have not reflected integration of elementary and secondary programs in their organization charts. In tiered organizations principals reported to area superintendents while in functional organizations they reported directly to central office. Information about administrative councils, where these existed, indicated that in no case were principals, teachers, or students a part of central decision-making. It was also found that the ratio of senior central office personnel to student population was inversely related to the size of the district. (Dr. Hickcox is an Associate Professor in the Department of Educational Administration at The Ontario Institute for Studies in Education; Mr. Ducharme is the Project Director at the OISE Mid-western Centre in Kitchener, Ontario.)

The reorganization of Ontario school systems into county units of administration in 1969 reduced the number of school boards in the province from 1700 to less than 200. The creation of these larger units triggered a massive restructuring of administrative roles in central offices across the province. This discussion focuses on structural patterns which have emerged since 1969.

Problem

The paper treats problems of organizational structure in a limited way. We examine the structure of the central office administrative staff including directors, superintendents, assistant superintendents and area superintendents. The analysis does not consider other central office personnel such as coordinators or consultants, nor does it treat the business side of the operation below the level of assistant superintendent of business.

In deciding how to approach the analysis of the information, we have been guided by two general considerations. First, we are aware of the general move toward accountability in education. Thus, analysis of structure must attempt to identify alternatives in organizational arrangements which will permit trustees to discover what they are getting for their money in terms of central office administration.

Second, we see decision-making as an important aspect of any administrative structure. Assumptions about how decisions should be made, what levels of the hierarchy are involved and distribution of responsibility are reflected in the organizational structure adopted by any particular board. In analyzing organizational charts from the various school boards in Ontario, we were thus interested in the relationships between officials, in the make-up of administrative councils, in the configuration of superintendents, assistant superintendents and area superintendents, and in whether the structure appeared to be flat or tall.

Procedures

A request for information was mailed to the seventy-one school systems in the Province which have appointed a chief school officer called a director of education. The information requested included the following:

1. A current description of the system's organization structure including an organization chart.
2. A description of the functions and/or responsibilities of academic officials above the rank of principal.
3. An indication of the 'accountability flow' in the organization.
4. Policy books, regulations and by-laws.

The return rate on our request was eighty-nine percent; our sample, therefore, is composed of sixty-three out of a possible seventy-one public school boards.

As a preliminary step in the analysis, we selected fourteen boards representative of the various geographical regions, rural and urban systems, and systems which combined both rural and urban elements. Within this sub-sample, we examined organization structures with a view to developing categories of organizational patterns. Simultaneously, we collected data on student populations for all systems.

As a result of this preliminary examination, we were able to create a chart showing the following information for the sixty-three boards in the sample: pupil population, organization category, number of assistant or associate superintendents, number of area superintendents, number of combination superintendents (superintendents who have a functional responsibility such as personnel and also have an area responsibility in the system), number of director's assistants (e.g., executive assistant), official to whom principal reports, degree of integration of elementary and secondary programs, size of executive council, composition of executive council, total number of administrators above the rank of principal, and ratio of senior administrators to student population.

Organization Categories

One of the questions that prompted this study in the first instance was whether the organizational structures adopted by Ontario school boards since 1969 showed variation among the boards or whether all structures tended to be similar across the Province. We have identified four general categories of structure characteristic of these boards as follows:

1. Pure Area Type

All school systems in the sample have a chief school officer called a director at the top of the hierarchy. Below the director in systems adopting this structure are area superintendents plus a business superintendent. The area superintendents may be responsible for a geographical area, including all the elementary and secondary schools, or there may be an area superintendent responsible for all the secondary schools and one responsible for all the elementary schools. Principals report to the area superintendent directly, depending on the geographical area in which their schools are located. In this situation, the area superintendent is a generalist, responsible for program, personnel and facilities within the area. Except for the business function, there are no functional specialities performed at the superintendent level. In very small systems, the director himself may perform the function of area superintendent.

2. Tiered Structure Type

This structure is characterised by a director at the top with a second echelon of functional superintendents including a business superintendent. These superintendents have titles such as superintendent of instruction, superintendent of operations, superintendent of personnel and the like. Below this level in the organization chart are area superintendents who generally report to one of the functional superintendents, often the superintendent of operations. In four of the systems in our sample, however, the area superintendents do not report to one functional superintendent but have direct access and responsibility to all. Even in systems where the area superintendent reports to one functional superintendent, there are often dotted lines in the organization charts indicating that the area men can go directly to the various functional officials as the need arises.

Principals in a tiered system report to their particular area superintendents and tend not to have direct access to the functional superintendent, with some exceptions. In the larger systems, the tiered pattern often shows two area superintendents for each area, and this most often implies one man responsible for secondary schools in the area and the other responsible for elementary schools.

3. Combination Type

In six of the systems in our sample, boards have opted for combining functional responsibilities and area responsibilities in one position. Thus, at the superintendent level, an individual will have responsibility for some function such as curriculum or personnel, and at the same time he will be in general charge of a geographical area.

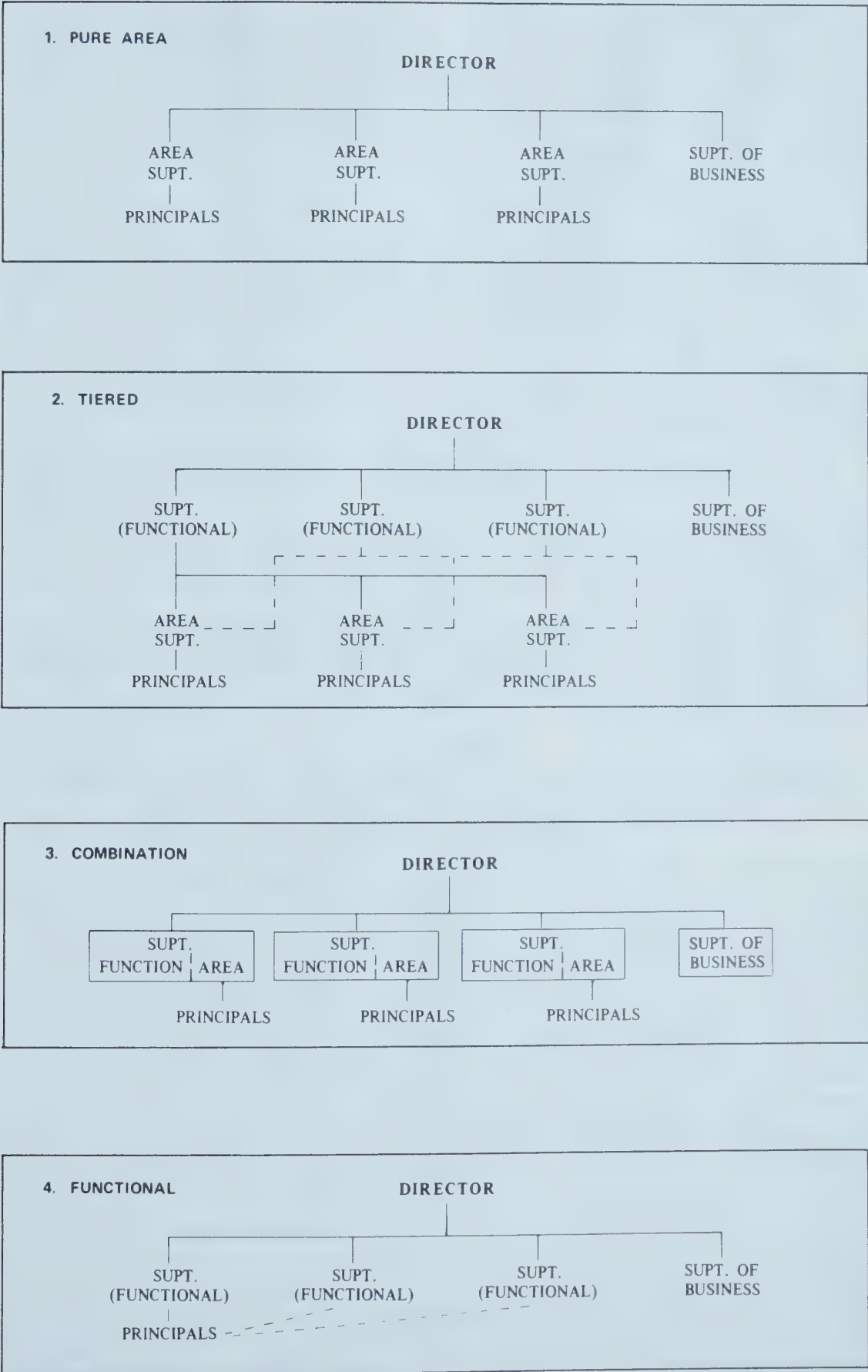


Figure 1—Four Types of Organization Structure.

Principals in such a structure report to a particular superintendent in his role as area supervisor. If assistance is required in functional areas other than the one for which the particular area man is responsible, the principal has only indirect access through his own supervisor. For example, if information about budget is required by a principal, he would probably ask his area supervisor to obtain it for him rather than going directly to the business office himself.

4. *Functional Type*

The final category exists in systems where the position of area superintendent has been eliminated. In this case, principals report directly to the functional superintendents for particular services. Thus if it is a problem in personnel, the principal would go directly to the superintendent of personnel. In some cases, principals would be directly responsible to one of the superintendents, for example, the superintendent of operations, but would have access to other functional areas.

We should note that small systems tend to look like functional types because they are not large enough to support a substantial central office staff. In several cases, for example, a system would have only a director and business administrator, and we were forced to categorize this as functional. We cannot say what would happen if these small systems were suddenly increased in size.

Table 1 shows in percentages the results of categorizing each of the sixty-three school boards according to the types described and according to pupil population of the various districts.

TABLE 1
ORGANIZATIONAL CATEGORIES OF SIXTY-THREE SCHOOL BOARDS
ACCORDING TO PUPIL POPULATION OF DISTRICTS
(REPORTED IN PERCENTAGES)

Pupil Population	Category					Total
	Pure Area	Tiered	Combination	Functional	Not known	
40,000 and over	2%	18%	2%	0%	0%	22%
20,000 to 39,999	2	13	2	3	0	20
13,000 to 19,999	0	13	3	3	0	19
5,000 to 12,999	3	3	3	8	2	19
less than 5,000	0	0	0	16	6	22
Total	7%	47%	10%	30%	8%	102%*

* % is greater than 100 because of rounding error.

Examination of these data shows that the tiered structure is most common, accounting for forty-seven per cent of the total. Next is the functional type, accounting for thirty per cent, followed by the combination type with ten per cent and the pure area type with seven per cent. From this information, it is evident that central office structure varies considerably.

Turning to the categories according to size, we note that the pure area type appears in three of the five population groups. That this structure is the least preferred of all is probably a reflection of the general move toward specialization in education. Area superintendents are by definition generalists, responsible for all activities in their area, even as a director is a generalist, responsible for the total educational program of the district.

The larger systems, those above 13,000 pupil population, have tended to adopt the tiered structure. It is obvious, of course, that the smaller systems could not be listed in this category because by definition three levels of central office are required, director, superintendent and area superintendent.

It is interesting to try to account for the popularity of the tiered structure in large districts. School boards, we assume, have responded to the need for specialized skills at top levels in school systems by creating the functional superintendents. At the same time, they have established area offices in an attempt to maintain manageable operating units both in terms of geography and numbers of students. In effect, boards have created mini-systems within the district to foster the sense of personal contact between schools and the central office. The area superintendents also enable a board to ensure a measure of administrative competence throughout the district, especially in areas where there are many very small schools which may have principals who also teach in the classrooms and who may be quite inexperienced in administration.

The combination structure has been adopted by six boards in the sample; these six are spread throughout four of the population groups.

We interpret the combination structure as a variation of the tiered structure but with the intent of reducing the size of the central office component. Instead of having two men, one to be responsible for a functional area and one to be responsible for a geographical area, there is one individual performing both functions. Since combining two jobs into one does not decrease the amount of work which needs to be done, we assume that some of the functions of the two roles are carried on by lower echelon personnel, consultants, coordinators and principals, with a theoretical saving in costs. Superintendents, after all, carry a high price tag.

Finally, the functional structure has been adopted by nineteen boards in the sample. Whereas boards of the largest size have not turned to this plan, it is interesting to note that relatively large boards, in the 13,000 to 40,000 groups, have in four instances eliminated area superintendents. Eliminating area superintendents does not, of course, eliminate areas, nor the need for coordination by areas. At least one of these large systems has compensated for this by creating area principals' councils consisting

of all the secondary and elementary schools in the region. This council establishes its own program, depending on the needs of the area, but does not operate under the direct supervision of a central office official. Instead, representatives of each of the principals' councils are members of an administrative council which acts as the coordinating mechanism for the whole system. All of the functional superintendents sit on this administrative council which makes recommendations to the director for presentation to the board. Similarly, policy decisions by the board are channeled to the schools through this council.

Administrator-Student Ratios

To arrive at an administrator: student ratio, the total student population of a system was divided by the total number of senior central office administrators. Included in the administrator count were directors, associate/assistant directors, superintendents, associate/assistant superintendents, area superintendents, business administrators at the superintendent level and inspectors.

The boards were then ranked according to student population and the sample was divided into five groups with more or less equal numbers in each group. The median ratio for each group is reported in Table 2.

TABLE 2
MEDIAN ADMINISTRATOR: STUDENT RATIOS ACCORDING
TO STUDENT POPULATION

Pupil Population	Median Administrator:Student Ratio
40,000 and over n=13	1:2980
20,000 to 39,999 n=12	1:2567
13,000 to 19,999 n=12	1:2211
5,000 to 12,999 n=12	1:2036
Less than 5,000 n=14	1:1217

The progressive increase in number of students per senior administrator as systems increase in size is immediately evident from Table 2. These results must be treated with caution however. Holdaway (1971), in a study of forty-one school systems in Western Canada, indicates that total non-instructional salary cost per pupil tends to increase consistently as the size of the school system increases. Our study has not examined total administrative structure as yet. Further study may indicate an optimum

size range for administrative efficiency. In systems which are too large, the principle of diminishing returns may operate.

One further word of caution. When speaking about optimum sizes for school systems, there are other factors which should be considered besides administrative efficiency as measured by student:administrator ratios and the attendant costs. Nature of services, dispersion of student population, political factors and cultural diversity are some which come to mind.

In looking at administrator: student ratios, we also singled out those systems which indicated a number of special assistants clustered around the director. These assistants might be information officers, computer specialists, executive assistants, and so forth. Our purpose in looking at these systems was to investigate the possible effects on administrator: student ratio of having one or more assistants clustered around the director.

Using the same population categories as indicated in Table 2, we find in the three middle groups a consistent indication that those which have appointed director's assistants have a greater number of students per senior administrator. In two of the three groups, the greater number of students is substantial.

For the smallest and the largest systems, the number of students per senior administrator is smaller for those systems with director's assistants. However, the difference is not substantial in the largest systems, and the N of 1 for the smallest systems with director's assistants belies any attempt to draw conclusions.

What are the implications of these figures? While the evidence we have presented is inconclusive and while there are other factors to be considered, it may be valuable for school boards to examine the following questions:

1. Are superintendents excessively burdened with the details of executing programs and policy decisions?
2. Could much of this detail be handled by someone in an administrative assistant capacity?

Put another way, the question is this: is it possible to free up an expensive superintendent's time by appointing a less expensive administrative assistant rather than an additional assistant superintendent?

Integration

There has been a move in recent years in education to adopt structures which reflect the integration of program from kindergarten through secondary school. Prior to reorganization in 1969, many Ontario communities maintained two entirely separate school systems, one for the elementary grades and one for the secondary grades. Even with the creation of county boards, some systems have retained the division within the overall framework by hiring superintendents of elementary schools and superintendents of secondary schools. Some boards have gone part way toward integration; some are fully integrated, at least on paper.

We have attempted to judge the extent to which the sixty-three systems in our sample reflect an integrated concept in their organizational structures. We define a fully integrated system as one in which functional superintendents and area superintendents are responsible for personnel, program and facilities on a K-13 basis. An area superintendent, for example, would be responsible for all the elementary and secondary schools in his area. A superintendent of curriculum would be responsible for curriculum in the elementary schools as well as in the secondary schools.

A partially integrated system is defined as one where there are two area superintendents for each area, one for elementary schools and one for secondary schools, or where certain of the functional responsibilities for superintendents are divided into elementary and secondary areas. That is, a superintendent might be responsible for personnel K-13 but the curriculum function might be assigned to two superintendents, one for elementary and one for secondary.

A non-integrated system is one where all the functions are divided into elementary and secondary, or where area superintendents are assigned either elementary or secondary responsibilities but not both.

The data show that fifty-five per cent of the districts reflect a fully integrated system in their organizational structure. Partial integration is shown for sixteen per cent of the districts, and fourteen percent indicate that they are not integrated. We were not able to determine the degree of integration for sixteen per cent of the school systems.

There is a slight tendency for larger districts to reflect full integration and for the smaller districts to reflect non-integration, although there is not enough variation to be meaningful.

It would be a mistake to assume that structural integration on an organizational chart represents a *fait accompli* for the educational program. Nevertheless, we suggest that systems reflecting integration in their structural arrangements have a better chance of accomplishing it in a program sense. Thus, the nineteen boards in our sample which do not show full integration in their organization charts will have greater difficulty in implementing a policy of program integration compared to the thirty-four boards which do show an integrated organization.

Accountability Flow

The general picture with respect to accountability flow has been discussed in the outline of organization categories. Our discussion at this point is restricted to the accountability of the in-school administrator, i.e., the principal and to whom he reports. The data are for the fifty-seven school boards which provided information on this topic.

In twenty-four of the twenty-nine tiered organizations for which we have information, the principal reports to the area superintendent, though in some instances he is able to by-pass the area superintendent if it is more appropriate to deal with a functional superintendent or the director. In thirteen of nineteen functional organizations, the principal reports to the superintendents. In all of the three pure area organizations,

the principal reports to the area superintendent, and in three of the six combination organizations, he reports to the superintendent.

The statistics clearly indicate the pattern but do not lead the observer to any immediate, dramatic conclusions. There are, however, important questions which arise as one considers the pattern and the principal's role in the school system. The general question is: What effect on the principal derives from his being several levels down in the chain of command in either a tiered or a functional structure? How does he perceive the status of his position? What effect does this have on his morale? How does he perceive his responsibility to the system vis a vis his responsibility to the school? How does the pattern affect the autonomy of the principal?

Executive Council

Twenty of the sixty-three boards in the sample provided us with information about their executive councils. In all cases, these councils include the director, second echelon academic superintendents and the superintendents and the superintendent of business or business administrator. In only one case were area superintendents included. Otherwise, there was no variation.

Again some interesting questions arise as one considers the composition of this executive body. In particular, what effect does restricting the membership of the executive council have on decision-making? Would there be more commitment to decisions if some representatives of the lower echelons were included on this council? Would it be useful to have in-school administrators and teachers represented on the executive council? How would such an arrangement affect morale? the frequency of conflict situations?

Conclusions

The results of the study show that there is considerable variation in types of organizational structure which have been adopted by public school boards in Ontario since 1969. The variation centers around the functions assigned to the superintendents of the systems, whether they are functional roles or area roles or some combination of these. We find, also that the ratio of senior central office personnel to student population decreases with the increase of the size of the district. Although one of the purposes of establishing county board systems was to achieve integration between elementary and secondary panels, we find that at least thirty per cent of the boards in our sample have not reflected full integration in their organizational charts. In terms of accountability, we find that in tiered organizations, principals report to area superintendents whereas in functional organizations, they report directly to the central office. In tiered organizations, therefore, principals tend to be removed from the center of decision-making, although in some tiered systems direct channels to the central office have been established. Finally, for those systems reporting information about administrative councils, we find that membership on these is limited to directors and

superintendents with one exception. In no case were principals, teachers or students part of this central decision-making body.

We do not imply in this study that structural concerns of the type discussed have a direct relation to the teaching-learning process. This occurs, of course, in the interaction between teacher and student. Nevertheless, it is our view that trustees and administrators must establish structures and relationships within those structures which will promote communication flow in all directions, enable programs to function in terms of objectives and in the end permit the teaching-learning process to occur in an efficient and effective manner.

References

- Holdaway, E. A. Staffing metropolitan school districts. *The Canadian Administrator*, 1971, 10(7), 29-33.

E. H. HUMPHREYS

Inequality and Rural Schools: Results of Surveys in 1967 and 1969

Surveys of Ontario elementary school teachers attempted to illuminate the relation between educational opportunity in terms of facilities, personnel and services, and the type of community in which a student lives. Data from questionnaire responses of 880 teachers in 1967 and 720 in 1969 indicated that a relationship exists between community type and (i) size of school, (ii) size of class (in 1967 but not 1969), (iii) availability of teaching aids, (iv) level of teachers' qualifications, (v) teaching experience (in 1969 but not 1967), (vi) availability of consultants, (vii) availability of special classes for atypical children, (viii) provision of special services, and (ix) employment of innovative practices. The relations generally favour urban children over those who live in rural communities. (Dr. Humphreys is an Assistant Professor in the Educational Planning Department at The Ontario Institute for Studies in Education.)

The mechanization of agriculture and the subsequent migration of young people to the city places a great responsibility on schools in rural areas to prepare children for the changing conditions they will meet throughout their lives. Numerous studies have examined the problems encountered by the rural migrants as they leave the rural economy and enter the urban work force. Porter (1965, p. 143), the Royal Commission on Education and Youth (1967, p. 13), Peitchinis (1969, p. 40), and the Special Planning Secretariat of the Privy Council (1965, pp. 7 and 15) have all called for a system of education that will prepare those who remain on farms for innovations in agriculture and those who migrate to the city for the conditions of work and life in an urban environment.

Problem

Do our present rural schools provide opportunities equal to the challenge? Do rural schools enable their students to compete with students from urban settings? This paper approaches these questions in terms of the "differences of the community's input to the school"

(Coleman, 1968, p. 16). The comparison of inputs is based on the Parsonian statement of opportunity; that is, opportunity is conceived of in terms of "a concrete resource aspect on the one hand, a normative controlled 'mechanism' or standard aspect on the other" (Parsons, 1964, p. 90).

The concrete factors—those related to the physical structure and facilities and to the staffing connected with them—were assessed. While it is primarily the concrete resource aspect that was dealt with here, the fact that normative factors are critical to the success of any educational enterprise should be borne in mind. The methods used to collect the data used in this study did not allow for consideration of normative factors; they did allow, however, for the collection of data on services that are related to the school program, as well as on physical structure and staff. The three groups of factors that were assessed were subdivided as follows:

Physical	Staff	Service
Size of School (Number of Teachers)	Level of Teaching Certificates	Availability of Special Classes for Atypical Children
Size of Class (Number of Students)	Teaching Experience	Provision of Special Services
Availability of Teaching Aids	Availability of Consultants	Extent of Innovations

Assumption

The factors assessed are regarded as indicators of the degree of commitment to a good education, but they are not the sole guarantee of the quality of the experience of children in the classroom. The author agrees with Coleman that "equality of opportunity is not so much determined by equality of the resources inputs, but by the power of these resources in bringing about achievement." (1968, p. 22)

While normative factors play a key role in the education of young children, as do the qualities of the relationships which exist between students and teachers, the availability of good teachers, adequate facilities, and the provision of necessary services also play their part in enhancing educational experience. Notwithstanding the findings of Coleman (1966), concrete factors can be assumed to be important to education; inputs are related to outputs.

Physical Factors

The three groups of physical factors used to assess the quality of schools were (a) size of school, (b) size of class, and (c) availability of teaching aids.

The size of the school indicates the degree to which facilities and experienced teaching, resource, and administrative personnel can be provided. It also indicates the difficulties teachers may encounter in coping

with students who differ in interests, age, and aptitude. It appears that schools with from about nine to twenty-five teachers are most appropriate at the elementary level (Sollars, 1963; Gentry & Kenney, 1967; and The Metropolitan Toronto School Board, 1968).

The size of class indicates the work load imposed on the teacher and the student's chance of receiving individual attention when needed. The larger the class, the less the time available for individual student-teacher interaction and the greater the teacher's difficulty in carrying out other duties. Small classes may indicate that specialized class groupings are being used to meet individual needs.

Assuming the presence of competent teachers who are able to utilize teaching aids, it seems likely that the greater the availability of aids, the better the teaching-learning situation. Reference books, films, and scientific apparatus are now tools of the trade and provide children with opportunities for vicarious experiences that are only possible if such aids are available.

Staff Factors

The quality of teaching staff is the most critical determinant of quality education. Data were obtained on three indicators of the quality of teaching: level of the certification of the teachers, their teaching experience, and the availability of consultants. While these three variables may indicate the potential for good teaching they do not necessarily measure the actual quality of the teaching-learning process. Such a measurement is beyond the scope of this study.

Of course the *quality* of the experience of a teacher is difficult to gauge. A teacher with six or eight years of classroom experience should be better than one with only one or two years. But would the same be true of a teacher with eighteen years experience as opposed to one with eight years?

In this study experience up to ten years was viewed as an asset; experience beyond ten years was considered to be of less value. In Ontario, consultants are experienced and well-qualified teachers who stay abreast of new developments in their disciplines and provide specialist help to trained teachers with more general training. Their availability is most necessary where less experienced or less qualified teachers are more frequently found.

Service Factors

The service factors assessed were the availability of special classes for atypical children, the provision of special student services (e.g., physicians, psychologists), and the extent of innovative practices. Schools can function without the same services, but their addition indicates an extension of the educational function of the school.

While special classes are not now universally accepted as the best method for educating atypical children,¹ it is probably safe to assume that

¹ A thorough discussion of this issue is contained in *One million children*, a report of the Commission on Emotional and Learning Disorders in Children (pp. 89-101). This study recommends that atypical children be retained "within regular school curricula and activities," but with specialized teaching assistance, and that those who "receive special instruction or treatment outside of the classroom . . . return to it at any time as a member in good standing" (p. 146).

the existence of such classes in 1967 or 1969 signified a recognition of the needs in this area. Data on classes for gifted, for slow learners, and for the physically and emotionally handicapped should provide evidence of the relation between community type and the provision of facilities and services for atypical children.

The availability of the professional services of nurses, physicians, psychologists and psychiatrists, dentists, and social workers may indicate the community's willingness to provide services for the physical, emotional, and social well-being of the student and its recognition of the relationship between such services and the academic and intellectual well-being of the individual.

Innovations may be regarded as an indication of the school's receptivity to new ideas. In total, enquiries were made about twelve innovations. Some do not require major expenditures. Although not all of the innovations assessed in this study would be considered by every educator as either positive or effective, the majority would be so viewed. Special language instruction for non-English speaking students and junior kindergartens for four-year-olds may be more appropriate in urban areas, for example, but most innovations should prove valuable in any area.

History and Organization of the Present Study

In response to the amalgamation of school districts in Ontario in 1965, the Ontario Teachers' Federation initiated a survey of school districts in the same year. This survey was replicated in 1967 and again in 1969, when the scope of the survey was enlarged to include teachers in all public and separate elementary schools (see OTF, 1965; Humphreys, 1967, 1970).

In each survey a population of teachers employed in publicly supported elementary schools was requested to complete a mailed questionnaire. Some of the data collected in the spring of 1967 and 1969 have been used in the present study. Of the 1967 stratified sample of 880 elementary school teachers, 720, or 81.8%, replied. In 1969, a stratified and weighted sample of 1,189 teachers returned 954, or 80.2%, of the questionnaires.²

Responses were classified by type of community on the basis of answers to the following question:

From what type of community does this school draw *most* of its students?

- Check one: 1. _____ Farming Community
2. _____ Village or Small Town (under 10,000 population)
3. _____ Small City (10,000 to 50,000 population)
4. _____ Large City or Metropolitan Area (50,000 Population or more)

Analysis of the questionnaires has been carried out using this classification. The year of data collection and the religious orientation of the school jurisdiction were controlled. A chi-square value was calculated across each contingency table, with the type of community on one axis and the item categories on the other. Tables included in this paper provide a summary of these χ^2 values.

² Due to the limited nature of the 1965 study, no data from that survey have been used here. Further data were collected in 1971.

Results

Size of School

As one would expect, the more urban an area, the larger its schools. Of the 16.6% of all Ontario teachers reported schools of twenty-seven or more teachers in 1969, most were in more urban areas. At the same time, of the 12.9% of all Ontario teachers that had eight or fewer colleagues, most were located in farming communities. The data for 1967 indicate a similar situation. The relation between school size and community type is indicated in Table 1.

TABLE 1
SUMMARY OF CHI-SQUARE VALUES AND LEVEL OF SIGNIFICANCE OF THE
RELATION BETWEEN NUMBER OF TEACHERS PER SCHOOL AND
COMMUNITY TYPE

Relation Tested	Public Schools 1967			Public Schools 1969			Separate Schools 1969		
	χ^2	df	p	χ^2	df	p	χ^2	df	p
Community Type by Teachers per School	337.81	24	.001	136.64	24	.001	92.03	24	.001

Size of Class

The data in Table 2 indicate that although a significant relationship between class size and community type existed in public schools in 1967, no such relationship existed in 1969 in either public or separate schools. In 1969 class sizes of between twenty-one and forty students were reported by about 80% of the teachers. Only 1% reported classes larger than forty students, and 11% reported classes with fewer than twenty-one students. The balance reported no class.

TABLE 2
SUMMARY OF CHI-SQUARE VALUES AND LEVEL OF SIGNIFICANCE OF THE
RELATION BETWEEN THE NUMBER OF STUDENTS PER CLASS AND
COMMUNITY TYPE

Relation Tested	Public Schools 1967			Public Schools 1969			Separate Schools 1969		
	χ^2	df	p	χ^2	df	p	χ^2	df	p
Community Type by Students per Class	34.25	15	.001	18.59	15	N.S.	22.39	15	N.S.

Availability of Teaching Aids

Table 3 shows that of thirty-three tests of inequality, only eight (all in 1969) indicated no relation between the community and the availability of an aid. In 1967 all eleven aids were found to be differentially distributed—the urban areas being in every case better supported by aids.

TABLE 3
SUMMARY OF CHI-SQUARE VALUES AND LEVEL OF SIGNIFICANCE
OF THE RELATION BETWEEN AVAILABILITY OF TEACHING AIDS
AND COMMUNITY TYPE

Relation Tested	Public Schools 1967			Public Schools 1969			Separate Schools 1969		
	χ^2	df	p	χ^2	df	p	χ^2	df	p
Community Type by Availability of:									
Classroom									
References	7.96	3	.05	5.22	3	N.S.	2.80	3	N.S.
School Libraries	114.83	3	.001	68.07	3	.001	35.35	3	.001
Professional									
Libraries	129.72	3	.001	97.02	3	.001	27.20	3	.001
Movie Projectors	172.89	3	.001	40.24	3	.001	31.73	3	.001
Filmstrip									
Projectors	80.47	3	.001	6.84	3	N.S.	17.54	3	.001
Record Players	45.76	3	.001	11.91	3	.01	3.26	3	N.S.
Tape Recorders	136.54	3	.001	16.09	3	.01	17.84	3	.001
Television Sets	60.10	3	.001	13.43	3	.01	2.17	3	N.S.
Standardized Tests	27.67	3	.001	5.80	3	N.S.	26.00	3	.001
Music Equipment	11.54	3	.01	4.65	3	N.S.	6.94	3	N.S.
Science Equipment	42.24	3	.001	13.99	3	.01	19.41	3	.001

It is also instructive to examine the types of aids available—that is, whether they are oriented towards “equipment” and “hardware” or towards “software” and “content.” In our study, the aids least frequently found were library resources for professional, reference, and student use, science equipment, and standardized tests. Those most frequently found were of the equipment or hardware variety, such as projectors, phonographs, tape recorders, and television sets.

Level of Teaching Certificates

The certification of Ontario teachers depends on the level of academic and professional education they have obtained in preparing for their role as teacher. Elementary school teachers with one year of professional training beyond grade 13 graduation hold Standard 1 certificates. Those with

one year of professional training beyond a B.A. or comparable degree hold Standard 4 certificates.

Table 4 indicates there is a significant relation between the type of community in which a teacher was employed and the teacher's level of certification. Teachers in farming communities were not on the whole as well qualified as their colleagues in urban areas. In 1969 59.9% of public school teachers in farming communities and 47.8% of those in large cities held minimum qualifications. Of public elementary school teachers in large cities, 22.6% held a Standard 4 certificate as compared to only 5.9% with such qualifications in farming communities.

TABLE 4
SUMMARY OF CHI-SQUARE VALUES AND LEVEL OF SIGNIFICANCE OF THE
RELATION BETWEEN LEVEL OF TEACHING CERTIFICATES AND
COMMUNITY TYPE

Relation Tested	Public Schools 1967			Public Schools 1969			Separate Schools 1969		
	χ^2	df	p	χ^2	df	p	χ^2	df	p
Community Type by Level of Teaching Certificates	70.89	24	.001	54.46	24	.001	65.90	24	.001

Teaching Experience

The length of experience of public school teachers was not differentially distributed in 1967, but it was in 1969. The data for 1969 indicated that the public school teachers in large city schools had less teaching experience on the average than those teaching in schools in farming communities. Only 31.4% of the teachers in large cities reported eleven or more years experience, as opposed to 49.3% in farming communities. Conversely, 37.7% of the teachers in large city schools had four years experience or less, while only 22.3% reported this little experience in farming communities. Some problems of a balance between the number of more experienced and less experienced staff appears in rural public schools and in urban separate schools.³

Availability of Consultants

Seven relations were tested between the availability of consultants and community type for the three sets of data. All proved to be significant; in both 1967 and 1969, consultants were available to the urban teacher

³ The reader is referred to a brief discussion of this point in Edward H. Humphreys, *Schools in change: A comparative survey of elementary school services, facilities and personnel, 1965-1969* (Toronto: Ontario Institute for Studies in Education, 1970), pp. 7-8. There was some evidence that rural areas relied heavily on women teachers who had left the profession to raise a family and returned some time later when the teaching shortage became acute in these areas. In many cases no retraining was undertaken, and the skills, attitudes, and approaches of such teachers were characteristic of the period when their training and certification were originally obtained.

TABLE 5
SUMMARY OF CHI-SQUARE VALUES AND LEVEL OF SIGNIFICANCE OF THE
RELATION BETWEEN TEACHING EXPERIENCE AND COMMUNITY TYPE

Relation Tested	Public Schools 1967			Public Schools 1969			Separate Schools 1969		
	χ^2	df	p	χ^2	df	p	χ^2	df	p
Community Type by Teaching Experience	24.64	24	N.S.	52.43	24	.001	40.81	24	.05

far more often than to the rural teacher, whether in public or in separate schools. According to the replies of public school teachers in 1969, urban teachers had access three times as often to consultants in mathematics and/or science, four times as often to reading consultants, five times as often to art consultants, twice as often to music consultants, about six times as often to speech consultants, over three times as often to physical education consultants, and four times as often to special and/or auxiliary consultants. Although the overall extent of availability was lower in separate schools, similar disparities between community types existed.

TABLE 6
SUMMARY OF CHI-SQUARE VALUES AND LEVEL OF SIGNIFICANCE OF THE
RELATION BETWEEN AVAILABILITY OF CONSULTANTS AND
COMMUNITY TYPE

Relation Tested	Public Schools 1967			Public Schools 1969			Separate Schools 1969		
	χ^2	df	p	χ^2	df	p	χ^2	df	p
Community Type by Availability of Consultants for:									
Science/									
Mathematics	265.93	3	.001	109.72	3	.001	37.02	3	.001
Reading	363.81	3	.001	145.94	3	.001	80.40	3	.001
Art	446.16	3	.001	174.35	3	.001	131.53	3	.001
Music	160.64	3	.001	91.00	3	.001	70.45	3	.001
Speech	487.44	3	.001	200.73	3	.001	131.95	3	.001
Physical Education	382.92	3	.001	134.81	3	.001	87.97	3	.001
Auxiliary	254.03	3	.001	110.92	3	.001	36.75	3	.001

Availability of Special Classes for Atypical Children

Every one of the tests reported in Table 7—for public schools in 1967 and for both public and separate schools in 1969—indicates that the provision of special classes for atypical children was closely related to community type. Rural areas provided fewer classes than urban areas. Classes for slow learners were reported in 20% more city than farm area reports, while other special classes were reported by seven to ten times more public school teachers from large cities than from farming communities. The differences between urban and rural areas in the separate school system were also great. There is obviously much greater opportunity for the atypical child in large cities than in farming communities.

TABLE 7
SUMMARY OF CHI-SQUARE VALUES AND LEVEL OF SIGNIFICANCE OF THE
RELATION BETWEEN AVAILABILITY OF SPECIAL CLASSES AND
COMMUNITY TYPE

Relation Tested	Public Schools 1967			Public Schools 1969			Separate Schools 1969		
	χ^2	df	p	χ^2	df	p	χ^2	df	p
Community Type by Availability of: Special Classes for Gifted or Accelerated Learners	236.69	3	.001	128.20	3	.001	10.28	3	.001
Slow Learners (auxiliary)	158.60	3	.001	24.75	3	.001	43.35	3	.001
Physically Handicapped	215.68	3	.001	54.23	3	.001	25.06	3	.001
Emotionally Handicapped	200.03	3	.001	120.22	3	.001	48.50	3	.001

Provision of Special Services

Of the fifteen tests of the relation between the provision of professional services and community type, fourteen showed that services were generally more available in urban than in rural communities. While nurses were almost universally available in 1969, only 38.4% of the public school teachers in large cities and 10.5% of the teachers in farming communities reported access to school physicians. Four times as many urban (92.5%) as rural (24.3%) public school teachers reported that psychologists or psychiatrists were available, and similar differences were true for dentists. While 37.1% of public school teachers in large cities indicated a social worker was available, this figure dropped to only 2.6% in farming communities. The reports of separate school teachers did not indicate that differences between rural and urban areas in the availability of special services were as great as in the public schools.

TABLE 8
SUMMARY OF CHI-SQUARE VALUES AND LEVEL OF SIGNIFICANCE OF THE
RELATION BETWEEN PROVISION OF SPECIAL SERVICES AND
COMMUNITY TYPE

Relation Tested	Public Schools 1967			Public Schools 1969			Separate Schools 1969		
	χ^2	df	p	χ^2	df	p	χ^2	df	p
Community Type by Provision of a:									
Nurse	18.87	3	.001	5.82	3	N.S.	10.83	3	.05
Physician	113.90	3	.001	57.99	3	.001	29.47	3	.001
Psychologist or Psychiatrist (by referral)	387.85	3	.001	161.70	3	.001	74.11	3	.001
Dentist	229.82	3	.001	110.05	3	.001	32.31	3	.001
Social Worker	150.37	3	.001	86.51	3	.001	38.63	3	.001

Extent of Innovations

In 1967, the type of community in which teachers were employed was found to be related to all twelve of the innovative practices assessed. By 1969, three innovations—group instruction in arithmetic, unit promotion, and mid-year promotion—were found as often in rural as in urban public schools. In separate schools (1969), no relation was found between community type and the use of seven of the twelve innovations. Only two innovations—group instruction in reading and report cards without marks, grades, or standings—were employed by more than 50% of the teachers, indicating a low level in the use of these twelve innovations. This low level is far more evident in schools in farming communities than in those in large cities.

Summary and Conclusion

This paper attempts to shed some light on the relation between educational opportunity, in terms of facilities, personnel, and services, and the type of community in which a student lives. The need for such an examination arises from the recognition that rural students who migrate to urban areas will be obliged to compete with graduates of urban schools in order to obtain employment. We must ask whether rural schools provide opportunities for their students comparable to those in urban areas. In his review of research on the education of disadvantaged rural youth, Edgington supports the need for improving rural education:

The movement of sub-population in the United States today is such that rural areas feed their problems and special characteristics into urban suburban populations. Although the problems of rural disadvantaged children, as this survey has shown, are not unlike those of other youngsters, rurality does impose certain conditions which exacerbate educational problems (Edington, 1970, p. 82).

This observation applies as well to Canada as to the United States since we also are experiencing the migration of rural youth to our cities.

TABLE 9

SUMMARY OF CHI-SQUARE VALUES AND LEVEL OF SIGNIFICANCE OF THE
RELATION BETWEEN EXTENT OF INNOVATIONS AND
COMMUNITY TYPE

Relation Tested	Public Schools 1967			Public Schools 1969			Separate Schools 1969		
	χ^2	df	p	χ^2	df	p	χ^2	df	p
Community Type by Extent of Innovations:									
Team Teaching	13.12	3	.01	7.98	3	.05	14.13	3	.01
Group Instruction in Reading	17.87	3	.001	11.27	3	.05	6.49	3	N.S.
Group Instruction in Arithmetic	17.90	3	.001	5.58	3	N.S.	6.07	3	N.S.
Non-Graded Instruction	14.04	3	.01	25.09	3	.001	10.90	3	.05
Unit Promotion	19.64	3	.001	5.24	3	N.S.	2.11	3	N.S.
Mid-Year Promotion	18.14	3	.001	4.97	3	N.S.	2.86	3	N.S.
Special Language Instruction for Non-English Speakers	130.07	3	.001	85.25	3	.001	43.37	3	.001
Special Program for the Culturally Deprived	18.91	3	.001	19.33	3	.001	4.02	3	N.S.
Kindergartens for 4-Year-Olds	59.87	3	.001	63.58	3	.001	5.94	3	N.S.
Guidance Services	48.38	3	.001	32.78	3	.001	22.38	3	.001
No Marks, Grades, or Standings on Reports	16.42	3	.001	27.34	3	.001	0.81	3	N.S.
Individual Student Program	36.22	3	.001	34.11	3	.001	15.22	3	.01

In this study of the provision of services, facilities, and personnel in Ontario elementary schools, an attempt has been made to examine one of the “conditions which exacerbate educational problems.” The evidence indicates that a relation exists between the provision of facilities, personnel, and services and the type of community in which the teacher respondents were employed. Insofar as the availability of the concrete resource aspects of education included in this study are indicative of the quality of education, one can conclude that Ontario students in urban communities are far better served than those in farming communities.

Although it should be recognized that the attitudes and aspirations of rural families may not result in as great a stress being placed on education, it is probable that the lower personal incomes of many rural residents and the resulting economic pressures have tended to maintain low standards of educational provision. Educational grants have raised the standards somewhat, but obviously far more needs to be done to overcome the reliance on property taxation as a major source of educational funding. Such a tax base creates anomalies in the amounts spent on education and hence in educational opportunity.

The creation of larger units of administration in Ontario in 1969 has helped to make the tax base more equitable, but at the same time, it has created major conflicts about the property tax, as rates formerly paid only by more urban property owners were extended to rural ones. While this has resulted in an improvement in the quality of facilities, services, and personnel in rural areas, it has also increased the cost of education to rural families with low incomes. Only an infusion of tax rebates has been able to quiet the complaints of Ontario's rural taxpayers.

A more rational process of equalizing educational opportunity for rural young people must be found. If society does not provide support for an adequate education before young people leave the farm, it must be prepared to support unemployed farm migrants in the cities while they gain the education they need to obtain a job. As far as basic education is concerned, the former course of action is obviously more appropriate, although training for work in specialized industries might be better provided after young people have migrated to the cities.

This study illustrates that Ontario fails to provide the educational opportunities in rural areas that are needed to ease the adjustment of young people forced to migrate to the cities. It would seem more rational to at least provide all young people with the "equal right to be recognized as unequal (Rogoff, 1961, p. 146)."

References

- Canada: Privy Council, special planning secretariat. *Profile of poverty in Canada: summary*. Mimeo document, 1965.
- Coleman, J. S. The concept of equality of educational opportunity. *Harvard Educational Review*, 1968, 38, No. 1, 7-22.
- Coleman, J. S. *et al.* *Equality of educational opportunity*. Washington: United States Government Printing Office, 1966.
- Commission on Emotional and Learning Disorders in Children. *One million children —the CELDIC report*. Toronto: CELDIC, 1970.
- Edington, E. D. Disadvantaged rural youth. *Review of Educational Research*, 1970, 40, No. 1, 69-85.
- Gentry, H. W., & Kenney, J. B. The relationship between the organizational climate in elementary schools and school location, school size and the economic level of the school community. *Urban Education*, 1967, 3, No. 1, 19-31.
- Humphreys, E. H. *A comparative survey of school districts in Ontario*. Toronto: Ontario Teachers' Federation, 1967.

- Humphreys, E. H. *Schools in change; A comparative survey of elementary school services, facilities and personnel 1965-1969*. Toronto: Ontario Institute for Studies in Education, 1970.
- The Metropolitan Toronto School Board, Study of Educational Facilities. *SEF-1. Educational specifications and user requirements for elementary (K-6) schools*. Toronto: The Ryerson Press, 1968.
- Ontario Teachers' Federation. *A survey of the consolidation of Ontario school districts*. Toronto: Ontario Teachers' Federation, 1965.
- Parsons, T. A functional theory of change. In A. Etzioni, & E. Etzioni (Eds.), *Social change*. New York: Basic Books Inc., 1964, 83-97.
- Peitchinis, S. G. *Equality and inequality of opportunity for economic and social development*. Mimeo, Department of Economics, University of Calgary, Human Resources Research Council of Alberta, 1969.
- Porter, J. *The vertical mosaic*. Toronto: The University of Toronto Press, 1965.
- Report of the royal commission on education and youth*. Vol. 1, St. Johns, Province of Newfoundland and Labrador: 1967.
- Rogoff, N. American public schools and equality of opportunity. In A. H. Halsey, J. Floud & C. A. Anderson (Eds.), *Education, economy and society*. New York: The Free Press, 1961.
- Sollars, R. D. The relationship of size of elementary schools to operational cost and program quality. *Dissertation abstracts*. 1963, 23: 3214 No. 9.

R. N. MacGREGOR

A Review of Selected Art Tests and Evaluative Instruments

A number of art tests and evaluative instruments are described and comments are offered on their suitability for various purposes. The tests are classified under four main headings: art tests as measures of "aesthetic preference"; multiple trait measures; art tests as indices of concept forming ability; and art tests as measures of social and personal adjustment. It is suggested that the complex nature of the variables with which art measures are concerned makes careful considerations of their characteristics and limitations mandatory if defensible conclusions are to be drawn from results. (Dr. MacGregor is an Assistant Professor in the Department of Secondary Education at The University of Alberta.)

Although one might intuitively suspect that art is a field which does not lend itself readily to standardized testing, a considerable number of measures purporting to isolate and to identify art behaviors have been devised within the past fifty years. From time to time the better known of these are put to use in studies which require an index of artistic performance or aesthetic response. If an art test is selected for such a purpose by a researcher, it is obviously in his interest to ensure that it is measuring what he expects it to measure. Yet at this time there has been little systematic, critical examination of art and art-related tests. This article attempts to summarize a number of the better known tests and to provide some guidelines for their appropriate use.

Measures of "Aesthetic Preference"

The early years of the twentieth century saw the regimented practices of the Walter Smith-influenced art program give way to the exercise of more liberal experiences, designed to cultivate the feelings, or "the finer sensibilities." It was therefore to be expected that some of the earliest research into the design of art tests should have as its focus the extent to which the aesthetic predilections of the subjects were re-

vealed by the testing instrument. Poffenberger and Barrows', "Feeling Value of Lines" (1924) described a procedure in which subjects chose from a number of adjectives one which best epitomized the character of a particular line. Their instrument was developed from earlier researches by Lundholm (1921) who had used eight subjects to draw lines purporting to embody the qualities of certain words. Poffenberger and Barrows reversed Lundholm's process and enlarged the number of subjects to 500 "educated people".

Although they reported a "substantial" measure of agreement among subjects, the reasons for such agreement are most probably to be found among Lundholm's sources, namely, in the writing of art historians and critics. These have dealt extensively with the architectonic features of art works, pointing out the presence of compositional rhythms and structural underpinnings and indicating how the eye "soars" or "lingers" in response to these features. As a result, a mythic fabric of association has developed by which ascending lines become identified with optimism and jagged lines with activity or rage. The fact that the 500 subjects referred to in the Poffenberger-Barrows study were explicitly termed "educated" lends support to conjecture that they were responding to a previously acquired body of associative material rather than to any intrinsic, affective properties possessed by the lines.

The McAdory Art Test appeared in 1929; it consists of 72 plates, each containing four variations of one picture. The variations involve changes in proportions, intensity and color within subcategories comprising furniture and utensils, textiles and clothing, architecture and related arts, shape and line arrangement, massing of light and dark, and color schemes. An examinee is asked to record his preferences, and is scored on a key designed by 100 experts (architects, artists and critics). That all items in the key were agreed upon by at least 64 per cent of the experts is in itself remarkable, considering their number and diversity (Greene, 1952). But, just as a dictionary is as much a record of how words are used as how they should be used, so the McAdory Test may be suspected of offering an indication of accepted conventional tenets in art in 1929.

Throughout the thirties, experimenters continued to favor tests in which preferences for one object over another were called for. The Meier-Seashore Test published in 1940 comprises 100 small uncolored pairs of pictures. One member of each pair is a reproduction of a "recognized masterpiece" (landscape, pottery, portraits, murals, medallions, etc.). The other shows the masterpieces with some alterations. The subject chooses the "better" of the two and the score he receives is derived from a key developed by artists, art teachers, and art training directors. The general similarity of the Meier-Seashore and the McAdory test, insofar as both reflect expert consensus, may account for the moderate (.37) correlations achieved between them in tests using small groups of college students (Greene, 1952).

A study of the Meier-Seashore pairs of pictures reveals that the alterations made to the originals to form the alternative picture choice are characterized by disturbance of the conventional principles of composition (i.e. the greatest value intensities should occur in the foreground; one

large block of matter ought to be balanced by several small ones; and so on). The Graves Design Judgement Test (1948), while using these same conventions, eliminates the possibly distracting effects of subject matter by including only non-representational designs. The test was validated by trying out 150 items on groups of art teachers, art students, and others in related and non-related fields. Selection of a final 90 items was made on agreement among teachers, significant differences between art and non-art students and items correlating highly with total test scores. Whatever their purported objectives, the tests which have been described are based primarily upon acquaintance with current canons of taste; individual or unconventional responses are penalized. Responses are founded on social as much as on aesthetic criteria.

Multiple Trait Measures

Study of the history of art reveals that each artist develops a recognizable working style or "strategy" by which he may be identified and placed on a continuum of styles. This possibility has been utilized by Burkhart (1962), Beittel (1963), and Bernheim (1964) in the development of procedures to assign art works to particular categories on the strength of the number and kind of work strategy characteristics exhibited within the work.

Flick (1963) attempted to show that Lowenfeld's "visual" and "haptic" types were characterized by constellations of attributes revealed through performance over ten tests; Eysenck's (1967) factor analysis of the Graves Design Judgement test uncovered a possibility of multiple factors. He writes:

The data do suggest that the 90 items of this test measure different abilities, so that it may not be entirely justifiable to throw all the scores together into one total score (p. 74).

The development by Rouse (1964-65) of a 20-point scale was an attempt to identify and define traits usually present in art products. Factor analysis of the items seemed to reinforce Eysenck's proposition that multiple factors are to be considered in the assessment of an art work. Rouse offered six factors for consideration: Non-differentiation/Differentiation; Space; Structural/Intellectual; Kinaesthetic-spontaneity; Internal Static/Dynamic Action; Conformity/Non-conformity.

Though Hilda Lewis' (1969) investigation included a proposed revision of the Rouse scale, she seems to have used the original 20-item scale as a starting point, rather than the six-factor measure just described. Lewis was particularly concerned with the extent of the relationship which her subjects (mostly elementary school teachers) were able to establish between "originality" (item 19 on the original Rouse scale) and "artistic quality". While she was able to conclude that such differentiation was possible, she added:

When the correlations between originality and the other 19 items for one picture were correlated with the same set of correlations for another picture, the results show that the pattern of interrelationship between originality and other items is not significantly similar for different pictures (Lewis, 1969, p. 34).

In face of evidence like this, the most sanguine testmaker might think twice before attempting to devise an evaluative instrument for "general art ability". There has in fact been a falling-off of interest in this type of instrument over the past three decades in favor of a greater degree of concentration upon measures of specific art-related factors.

The Lantz Easel Age Scale is one such measure (Lantz, 1955); its main purpose is to provide a record of growth and adjustment for kindergarten and elementary school children through an examination of their easel paintings. The success of the scale depends upon taking repeated measures on four dimensions of the child's painting:

- (1) form (on a seven point scale: an increasing ability to use lines, circles, squares);
- (2) detail (on a seven point scale: an increase in the amount of detail employed);
- (3) meaning (on a six point scale: an increasing ability "to paint a picture which has meaning to the adult") (Lantz, 1955, p. 2); and
- (4) relatedness (on a five point scale: increase in depth perception, and the ability to demonstrate knowledge of "above", "behind", "beside" and similar relationships).

Eliminated from consideration are what Lantz has termed "Q" paintings. These may be non-characteristic, painted during a fit of anger or depression, or a manifestation of some deeper, long-lasting emotional problem. Lantz recognizes that in the initial period while teacher and children are getting to know each other, "Q" paintings will be fairly common.

The kindergarten teacher will, no doubt, look over her first pictures of the year . . . and decide that she has a room full of emotionally disturbed children; and she undoubtedly has. The transition from the security of the home to school group conformities . . . often creates tensions, anxieties, frustrations, aggressions, and withdrawals as well as happy acceptance (1955, p. 9).

She suggests that even well-adjusted children revert to "Q" paintings in new or frustrating situations; hence the necessity for a *succession* of paintings, if any estimate of growth is to be made.

Reliability coefficients for the Easel Age Scale were very high (.95 on retest and .94 on inter-judge reliability). Internal validity was established by computing intercorrelations among subscores for Form, Detail, Meaning and Relatedness. The lowest intercorrelation (.59) occurred for Detail/Relatedness, while the highest (.87) occurred for Form/Relatedness. A range of correlations resulted when scores obtained on the test were compared with scores obtained with the California Test of Mental Maturity for Intermediate Grades. Since there occurred a decrease in correlations with the CTMM from primary to elementary to intermediate grades, one may speculate that the Easel Age Scale is most efficient when it is used for the paintings of kindergarteners and children in primary grades.

Art Tests as Indices of Concept-Forming Ability

A number of researchers have sensed the possibilities of using art works as a means of determining intellectual competency. Graphic

evidence of how a subject relates one part of an object to another, or the extent to which he produces differentiation among forms, may result in an estimate of perceptual efficiency or of concept-forming ability. Aesthetic factors are normally unimportant in tests of this type. In her account of the development of the Draw-a-Man Scale, for instance, Goodenough (1926) was careful to point out that artistic "standards" were not relevant for her purposes. Basically, the test involves asking the children to draw a man, which is then pointscored on the presence of certain features or characteristics—the presence of fingers, for example, or an indication of nostrils. By substituting age norms for the total point score, a mental age is established and an I.Q. score can then be calculated.

Norms were established by consideration of chronological age and school grade. Goodenough's first intention was to find an alternative measure of intelligence, one which called for graphic rather than verbal response. "A Man" was decided upon as the preferred subject for representation, since it met the criterion of familiarity to the subjects, had little variability, and had universal appeal. Almost 4,000 subjects, of ages from four to ten years, were used in the final standardization of the test. Results led Goodenough to claim that it had predictive validity for a child's future success in school; moreover, she noted an average correlation from normative samples of .76 between Stanford Binet Mental Age and Draw-a-Man Mental Age. However, one of Goodenough's former associates subsequently pointed out the shortcomings of Goodenough's method of deriving mental age:

It has been shown repeatedly that because mental abilities do not develop in a strictly rectilinear function this method of depicting mental level presents certain statistical problems. Unless the construction and standardization of the measure are very carefully conducted, there will be a variation in the standard deviation of scores from age to age, which will make a given I.Q. value of different significance, so far as indicating exceptionality is concerned (Harris, 1963, p. 88).

In addition to its function as an alternative measure of intelligence, the Goodenough test provided, according to its developer, an index of conceptual growth:

... at any given time a child's drawing will consist of two parts—the first part embracing those characteristics which have already become an integral part of his concept of the object drawn and consequently appear invariably; the second part including the elements which are in process of becoming integrated and are therefore shown with more or less irregularity. The frequency with which any given characteristic tends to appear is a function of the extent to which it has become integrated into the developing concept, and a measure of the weight which should be given it as an index of concept development (Goodenough, 1926, p. 75).

Harris' (1963) revision of Draw-a-Man attempted an upward extension of the test into the adolescent years. (Goodenough had cast doubts upon the validity of the measure after the onset of self-consciousness, typically occurring around 11 years of age.) Harris' interest was also directed towards the development of alternative forms of the scale, such as drawing a woman and drawing oneself. His subjects were drawn from K through grade 9 classes, each sample being made up of 100 children. Among his

findings was "a surprisingly modest" correlation of .75 between Draw-a-Man and Draw-a-Woman scores, which led him to speculate that perhaps different abilities were measured by these instruments (Harris, 1963, pp. 106-107). It is difficult to see what these might be, but inconsistencies may be somehow related to a relative lack of social interest displayed by the boys (noted both by Goodenough and by Harris).

As a counterpart to the analytic method of the Goodenough-Harris measure, Frankiel (1956) developed a scale to provide for holistic assessment. She used some of those drawings which Harris had employed in standardization, and asked 12 judges to rate a selection of drawing on "ideas", "inclusion and accuracy of detail" and "proportion". Their ratings resulted in the selection of 23 drawings to form the Quality Scale. When Quality Scale scores were correlated with point scores over several age group combinations, employing as raters five judges ranging from naive to experienced, coefficients varied between .79 and .84. Harris (1963) pointed out that the Quality Scale was ". . . useful principally because the Point Scales had been previously constructed and their validity painstakingly established (p. 114)." Both "inclusion and accuracy of detail" and "proportion", it should be noted, are terms closely allied to items which a scorer is expected to rate on the Point Scale.

Art Tests as Indices of Social and Personal Adjustment

The use of graphic measures is occasionally mentioned in the literature associated with some aspects of psychiatry (Machover, 1949), sociology (Dennis, 1966), and anthropology (Havighurst, 1946) as means to reveal attitudes and personality traits which are not readily obtainable through verbal interaction. For example, an exhaustive collection of drawings based on the instruction "Draw-a-Man" has been compiled by Wayne Dennis (1966). From an extended study of this material, Dennis has formulated a hypothesis which has predominantly sociological connotations: "that children draw the men whom they admire and who are thought of favourably by their societies (p. 2)."

One of Dennis' surveys (1966) features 2,550 drawings from places as widely scattered as Brooklyn, Edinburgh, Heidelberg, and Taiwan. In contrasting a "familiarity hypothesis" (i.e. that children draw that which they are most familiar with) with a "value hypothesis" (i.e. that children draw that which they most admire), Dennis produces a wealth of material to support the latter at the expense of the former. He cites numerous instances in which familiar ethnic clothing and appearance details are ignored; workers are, in every sample, infrequently represented since, he feels, they have little status. Dennis acknowledges the difficulty of validating his hypothesis, because there are no established techniques yielding categories of values similar to those which he has developed. But inferential evidence has been forthcoming. In a more recent study (Dennis, 1968) he notes that the number of Negroes drawn by Negro children has shown a noticeable increase within the past decade as the black self-image has become more positive.

Dennis believes that the child's drawing is primarily a reflection and projection of social values; other researchers favour a more personal inter-

pretation. Typical of the "personality projection" approach is Machover's 1949 study. Her method is clinical rather than experimental. Over a period of fifteen years she built up a file of drawings of men and women, furnished by subjects undergoing analysis, and she has attempted to describe those graphic characteristics which, she feels, reveal the conflicts, impulses, and anxieties of these subjects. Machover (1949) quotes Anastasi and Foley's (1941) misgivings on the extent to which such differentiation could be made: ". . . only in the presence of extreme mental disorders and only with individuals who offer personalized, startling, or bizarre productions (p. 19)." Nevertheless, Machover feels that patterns of drawing traits can be used extensively in helping to diagnose aberrations, and claims that "Though some of the assumptions may lack experimental verification, they have proved clinically valid (p. 34)."

Machover's text describes an experiment in which an effort was made to match sets of anonymous drawings with case records. The judges were herself and one other competent clinician. A degree of matching was reported which was better than chance. But since there were no randomized drawings by "normals" included, the results have little experimental significance. Warning against the popularization of her methods, Machover (1949) pointed out that many normal children's drawings contain traits which in her case studies are classified as aberrant. Remarks which she made on the drawings of a grinning mouth ". . . interpreted as forced congeniality, an effort to win approval (p. 35)" or that an obsessive pre-occupation with an area is indicated by much erasing in that area are appropriate only to clinical analysis of individuals, and cannot safely be applied to the analysis of drawings produced in the classroom.

Conclusion

On the basis of the examples offered, the construction of "art tests" seems to be predicated upon the following questions:

1. What is the extent of the subject's ability to make qualitative choices among art objects or art works of differential aesthetic merit? (the *qualitative decision-making* aspect)
2. What kinds of verbal/non-verbal responses do subjects make to selected stimuli, which might reveal their current ability to process information? (the *cognitive* aspect)
3. What kinds of verbal/non-verbal responses do subjects make to objects and situations, which might reveal their emotional, subjective feelings or their socio-cultural characters? (the *attitudinal* aspect)

In addition, tests such as that designed by Eisner (1965) to ascertain the extent of a subject's knowledge of art history, artists, art terms and processes require inclusion as a separate aspect.

4. What is the present state of the subject's knowledge regarding the identification of art objects and artists, art methods and processes, and overt forms of art activity? (the *informational* aspect)

Of these four aspects, only the last can be expected to yield relatively unambiguous and stable results. Any form of qualitative decision making requires a set of acceptable criteria for what constitutes a "better" or

“worse” art work. But Weitz (1962) has pointed out the impossibility of establishing a finite number of such criteria; it therefore becomes the obligation of the individual researcher to draw up limited criteria, to make these known to subjects prior to testing, to adhere to them strictly in scoring, and to make interpretation of the results only insofar as his self-imposed limitations permit.

Graphic tests of a “cognitive” nature must also be interpreted with caution, since there is no guarantee that the subject’s drawing is an adequate reflection of his capacity to handle information. A graphic vocabulary is acquired through practice; the unpracticed individual may be judged to lack concept-forming capacity when he really only lacks graphic skill. Also, the fact that a phenomenon is perceived carries no guarantee that it will thereafter appear in graphic form, particularly in the case of small children, whose priorities for including details shift markedly from one drawing to the next. Using art tasks as projective measures in an attempt to establish a personality profile may be justified for clinical purposes. Repeated applications of tests of this type seem desirable, if evidence of aberration is required. The anthropologist’s considerations must include the status accorded graphic art activity within a society, together with prevailing cultural taboos and strictures (Ballinger, 1969).

Clearly, then, the complex nature of the variables with which art measures are concerned, at other than strictly informational levels, and the difficulty of isolating these variables for experimental purposes, call for rigid controls or exhaustive descriptions of the testing situation, in order to achieve results which can be accepted and defended with confidence.

References

- Anastasi, A., & Foley, J. A. A survey of the literature on artistic behavior in the abnormal. *Journal of Genetic Psychology*, 1941, 25, 111-237.
- Ballinger, T., & Sundberg, N. *Drawings by Nepalese children*. Occasional Paper No. 5, The Creative Education Foundation, Buffalo, N.Y., 1969.
- Beittel, K., & Burkhart, R. Strategies of spontaneous, divergent and academic art students. *Studies in Art Education*, 1963, 5, 20-41.
- Bernheim, G. The dimensionality of differential criteria in the art product. *Studies in Art Education*, 1964, 6(1), 31-48.
- Burkhart, R. C. *Spontaneous and deliberate ways of learning in art*. Scranton, Pa.: International Textbook, 1962.
- Dennis, W. *Group values through children’s drawings*. New York: John Wiley, 1966.
- Dennis, W. Racial change in Negro drawings. *Journal of Psychology*, 1968, 69, 129-130.
- Eisner, E. W. Curriculum ideas in a time of crisis. *Art Education*, 1965, 17, 7-12.
- Eysenck, H. Factor-analytic study of the Maitland Graves Design Judgement Test. *Perceptual and motor skills*, 1967, 24(1) 73-74.
- Flick, P. Ten tests of the visual haptic aptitude. *Studies in art Education*, 1963, 4, 24-34.
- Frankiel, R. A quality scale for the Goodenough Draw-a-Man Test. Unpublished Master’s thesis, University of Minnesota, 1956.

- Goodenough, F. *Measurement of intelligence by drawings*. New York: Harcourt Brace, 1926.
- Graves *design judgement test*. New York: Psychological Corporation, 1948.
- Greene, E. B. *Measurement of human behavior*. New York: Odyssey, 1952.
- Harris, D. *Children's drawings as measures of intellectual maturity*. New York: Harcourt Brace, 1963.
- Havighurst, R. J., et al. Environment and the Draw-a-Man Test. *Journal of Abnormal Psychology*, 1946, 41, 50-63.
- Lantz, B. *Easel age scale*. Los Angeles: California Test Bureau, 1955.
- Lewis, H., & Mussen, P. The development of an instrument for evaluating children's artistic creativity. *Studies in Art Education*, 1969, 10(3), 25-48.
- Lundholm. Affective tone of lines. *Psychological Review*, 1921, 28, 43-60.
- McAdory, M. *The McAdory art test*. New York: Bureau of Publications, Teachers' College, Columbia University, 1929.
- Machover, K. *Personality projection in the drawing of the human figure*. Springfield, Illinois: Thomas, 1949.
- Meier, N. C., & Seashore, C. *The Meier-Seashore art judgement test*. Iowa City: Bureau of Educational Research and Service, University of Iowa, 1940.
- Poffenberger, & Barrows. Feeling value of lines. *Journal of Applied Psychology*, 1924, 1, 187.
- Rouse, M. J. *Development and validation of descriptive scale for measurement of art products*. Cooperate Research Project No. S-007, Indiana University, 1964-65.
- Weitz, M. The role of theory in aesthetics. In N. Margolis (Ed.), *Philosophy looks at the arts*. New York: Scribners, 1962, pp. 48-58.

D. M. RICHARDS

Predicting the Demand for Teachers

The recent change in the supply-demand relationship of the teaching force in Canada has led to many examinations of the situation as it obtained over the past two decades. While many studies have proceeded as if the major cause of the increased demand for teachers has been an increase in the school-aged population, this study set out to examine the relative importance of increased population, attendance rates, and structural changes within the educational system as these factors relate to teacher demand. The findings of the study indicate that while the major factor in determining the increased demand for elementary and junior high school teachers has been an increase in the population, the increased demand for high school teachers has been most closely related to increased attendance rates. The change in the structure of the educational system has been an important factor in teacher demand at all levels. (Dr. Richards is an Assistant Professor in the Department of Educational Administration at The University of Alberta.)

During the past two decades, all parts of Canada have experienced the effects of a shortage of teachers. While some parts of Canada have experienced more difficulty than others as a result of this shortage, most school authorities have had to resort to unusual measures to obtain a sufficient number of staff. Recently, this situation has changed rapidly. In Alberta, for example, the early 1960's saw school authorities actively recruiting teachers from other countries. During the 1970-71 school term, little difficulty was experienced in obtaining a sufficient number of teachers. During the 1971-72 school term, there appears to have been a surplus of trained teachers in Alberta.

Problem

Two questions have been raised in regard to the teacher supply in Alberta:

1. Could the current over-supply of teachers have been predicted?

2. What are the important factors influencing the demand for teachers in Alberta?

The above two questions are generally related to educational planning, and there is a belief that the techniques of educational planning may provide the answers to these two questions.

Social Demand Model

One of the most common forms of educational planning has been the social demand approach. Although there have been a great many modifications in the technique as it has been applied, the following constitutes a common procedure:

1. estimate the number of persons that have a "right" to education;
2. estimate the levels of education that will be demanded based on past trends;
3. estimate the kinds of specialized education that will be demanded based on past trends;
4. relate step 1 to steps 2 and 3 to obtain an estimate of the demands upon the educational system; and,
5. estimate the various resources including teaching staff, required in the educational system. Thus, in general the social demand approach assumes that the number of teachers required is essentially a function of the population.

A Recent Study

In a recent study conducted at The University of Alberta, (Richards, 1971) an attempt was made to examine the demand for teachers through the social demand approach. In this study, an estimate of the future population was made on the basis of the present population, estimates of birth rates, estimates of death rates, and estimates of migration rates. An estimate of the future school population was made on the basis of total population and estimates of attendance rates. An estimate of the future demand for education at various levels and of various kinds was based on the school population. An estimate of the future number of various kinds of teachers required was based on the demand for education. In terms of mathematical formulae, the model could be expressed as follows:

$T=f(E)$, where T was the number of a particular type of teacher required,
and
where E was the demand for education.

$E=f(S)$, where S was the number of a particular age of student

$S=f(P_2)$, where P_2 was some future population.

$P_2=f(P_1, B, D, M)$, where P_1 was the present population,
where B was the birth rate,
where D was the death rate,
and
where M was the migration rate.

While the bases of some of the calculations were in some cases quite complex, the fundamental relationships among some of the variables may

be translated into simple terms. The relationship between the number of each type of teacher required and the demand for education depended to a large degree upon the pupil-teacher ratio. The relationship between the demand for education and the number of students depended to a large degree upon the enrolments in various courses. Attendance ratios were used to reflect the relationship between the number of students and the population. The population projections were carried through using a basic cohort-survival technique with migration treated as a residual. That is, while birth rates and death rates were available, migration was estimated from the 1961 and 1966 census. Thus, the population projection depended upon variables which were largely uncontrollable to the education system while all other mathematical relationships were dependent upon variables controllable as a matter of policy of various school systems within Alberta.

To further explain the above, population is affected by births, deaths, and migration. These variables depend upon events and decisions which are uncontrollable, in the present situation, by all levels of government. However, the attendance of an individual in school can be determined largely by policies of the provincial and federal governments. Similarly, the enrolment of a student in a particular course, while it may be left to the discretion of the student, can easily be conceived of as a matter of policy of the local or provincial school authority. The demand for teachers is then a function of both controllable and uncontrollable variables.

The Projections

In the study referred to previously, several projections of the demand for teachers in Alberta were made. For each of the variables mentioned, several future values were hypothesized. These hypotheses were based on values and trends in values of the particular variables. That is, information was compiled for the period 1951 to 1967, inclusive, regarding age-specific birth rates, age- and sex-specific death rates, enrolment by age and grade, enrolments by subject, and pupil-teacher ratios. Although several different projections were made using the assumed values of the above parameters, only a few of these projections are of interest in this paper.

With the values of the variables assumed such as to produce, alternatively, the highest possible and the lowest possible demand for teachers in Alberta, a very wide range was predicted. For example the range in predictions for 1975-76 was from 16,537 to 27,163 teachers in Alberta. For 1980-81 the range in predictions was from 16,875 to 36,160. For each year of the projections, a medium value was predicted using the most reasonable values of the variables. For 1975-76 the medium value was 20,987 teachers and for 1980-81 the medium value was 23,539 teachers. It should be noted, on the basis of more recent data, the medium value of the projections would appear to be biased slightly low.

Controllable vs. Uncontrollable Variables

Since many of the past studies of the demand for teachers have been based largely on the population growth, it was of interest to examine

the effect of only the population variables on the demand for teachers. For this reason, all other variables were set so as to predict the medium values of teacher demand while a combination of high birth rates and low death rates was used alternately with a combination of low birth rates and high death rates. The range of predictions derived from these variables was from 19,527 to 21,990 teachers for 1975-76 and from 19,931 to 26,025 teachers for 1980-81.

The results of the projections mentioned thus far illustrate that even though wide ranges were characteristic of the projections, the population variables accounted for only 23 per cent of the total range of the projections for 1975-76 and 32 per cent of the total range for 1980-81. The suggestion that arises from these results is that policy and not population may be responsible for large changes that occur in the demand for teachers.

Past Demand for Teachers in Alberta

Since the projections emphasized the importance of policy variables, it was of interest to examine the change in the demand for teachers in Alberta over the period 1951-52 through 1966-67 to determine the relative effects of policy and population.

The period 1951-52 through 1966-67 was characterized by a rapid increase in the population. Increases of 92 per cent, 105 per cent, and 74 per cent occurred in the age groups 5 to 9, 10 to 14, and 15 to 19 respectively (DBS, 1953-1968). For the total of all three of these age groups the increase was 91 per cent. Of the school aged population the attendance of five year olds decreased slightly over the time period while the attendance of fourteen to nineteen year olds increased. The effect of only the change in the population has been to almost double the demand for teachers in Alberta over the period 1951-52 through 1966-67.

Actual Increases in Demand for Teachers

It was of interest, in the light of the population and attendance changes, to examine the actual change in the demand for teachers. To accomplish the examination of demand, the definition of teacher that has been used by the Alberta Department of Education was adopted. Also, the demand for teachers was examined in terms of the categories elementary school teachers, junior high school teachers, and high school teachers. In 1951-52 there were 4,097 elementary school teachers, 1,714 junior high school teachers, and 1,127 high school teachers for a total of 6,938 teachers (Alberta, Department of Education). At the same time the pupil-teacher ratios were 28.2:1 for elementary, 24.4:1 for junior high, and 19.7:1 for high school. By 1956-57 the numbers of teachers were 5,487 elementary, 2,316 junior high, and 1,470 high school teachers for a total of 9,273 teachers and pupil-teacher ratios of 27.2:1, 23.8:1 and 20.4:1. In 1961-62 the number of teachers were 7,880 elementary, 3,017 junior high, and 2,445 high school for a total of 13,342 teachers with pupil-teacher ratios of 23.4:1 for elementary, 25.2:1 for junior high, and 19.2:1 for high school. In 1966-67 there were 10,393 elementary teachers, 4,362 junior high school teachers, and 3,559 high school teachers for a total of 18,314 teachers and

pupil-teacher ratios of 20.5:1 for elementary, 21.1:1 for junior high, and 19.0:1 for high school. These data are illustrated in Table 1.

TABLE 1
PUPIL-TEACHER RATIO IN ALBERTA IN SELECTED YEARS*

Year	Level	Teachers	Pupils	Pupil-Teacher Ratio
1951-52	Elementary	4,097	115,655	28.2:1
	Jr. High	1,714	41,813	24.4:1
	High	1,127	22,223	19.7:1
1956-57	Elementary	5,487	149,111	27.2:1
	Jr. High	2,316	55,228	23.8:1
	High	1,470	30,058	20.4:1
1961-62	Elementary	7,880	184,659	23.4:1
	Jr. High	3,017	76,173	25.2:1
	High	2,445	46,870	19.2:1
1966-67	Elementary	10,393	213,058	20.5:1
	Jr. High	4,362	92,256	21.1:1
	High	3,559	67,579	19.0:1

* Source: Richards, 1971, p. 6

For the time period 1951-52 to 1966-67, the increases in the numbers of teachers required have been 154 per cent for elementary teachers, 155 per cent for junior high school teachers, 215 per cent for high school teachers, and an increase of 164 per cent in total. Obviously the requirement for teachers over the time period has increased by a factor greater than two and one half as compared to population changes of about a factor of two.

Effect of Population Changes

If the attendance rates and structure of the education system had remained as they were in 1951-52, the population changes would have increased the demand for teachers in 1966-67 to 7,847 elementary teachers, 3,513 junior high school teachers, 1,960 high school teachers, and a total of 13,320 teachers. Of the total increase in the demand for teachers between 1951-52 and 1966-67 the proportions corresponding to the increases in population were 60 per cent of the elementary teachers, 68 per cent of the junior high school teachers, 34 per cent of the high school teachers, and 56 per cent of the total. Table 2 illustrates these data.

Effect if Changes in Attendance Rates

The change in attendance rates, if structural changes had not occurred, would have resulted in the following demands for teachers in 1966-67; 7,555 elementary teachers, 3,780 junior high school teachers, 3,430 high school teachers, and a total of 14,766 teachers. These data reflect increases in demand due to attendance changes of -5 per cent of the increase in

elementary school teachers, 10 per cent of the increase in junior high school teachers, 60 per cent of the increase in high school teachers, and 13 per cent of the total increase.

TABLE 2
EFFECT OF CHANGES IN POPULATION, ATTENDANCE, AND
STRUCTURE ON THE DEMAND FOR TEACHERS IN
ALBERTA FROM 1951-52 TO 1966-67*

Factor	Elementary	Jr. High	High	Total
Actual 1951-52	4,097	1,714	1,127	6,938
Actual 1966-67	10,393	4,362	3,559	18,314
Increase	6,296	2,648	2,432	11,376
Population Change	7,847	3,513	1,960	13,320
Per Cent of Increase	60	68	34	56
Attendance Change	7,555	3,780	3,430	14,766
Per Cent of Increase	-5	10	60	13
Structure Change	(increase unaccounted for by changes in population and attendance)			
Per Cent of Increase	45	22	5	31

* Compiled from Table 1

The above data illustrated in Table 2, suggest that much of the increase in the demand for teachers has resulted from population and attendance changes. Further examination of the data also suggests that some of the increase in the number of teachers has been taken up with a reduction of the pupil-teacher ratio. While this has some basis in fact for the junior and senior high school, it appears to be particularly true in the case of the elementary school. Since all staff with teaching qualifications have been counted as teachers, the above may indicate structural changes in the elementary school systems. Increases in the release time for administrators or more professional staff may be among the structural changes anticipated. Also, the introduction of special classes in the elementary schools would certainly have had an impact upon the pupil-teacher ratio.

Effect of Changes in Structure

To relate the effects of structural changes to the increase in the demand for teachers, the actual demand for 1966-67 was compared to the demand that accounted for only population and attendance changes. The proportions of the increases in demand for teachers that could be attributed to structural changes were 45 per cent for elementary school teachers, 22 per cent for junior high school teachers, 5 per cent for high school teachers, and 31 per cent for the total. Obviously, structural changes in educational organizations have accounted for a significant part of

the increase in the demand for teachers especially in the case of the elementary school.

Conclusion

The fact that population changes accounted for only a small portion of the range of projections of the demand for teachers suggested a re-examination of the factors associated with the past increases in the demand for teachers. Over the period 1951-52 through 1966-67, even though population increases accounted for a major part of the increase in the demand for teachers, changes in the attendance rates and changes in the structure of educational organizations combined to account for nearly one half of the total increase in the demand for teachers. Thus, if predictions of the current demand for teachers had been based exclusively upon population changes, it is likely that the present demand would have been underestimated and the current over supply would have been over estimated. The predictions of the future demand for teachers are thus subject to large errors if based only upon population changes.

References

- Dominion Bureau of Statistics. *Population*. Ottawa: Queen's Printer, 1953, 1958, 1963, 1968.
- Government of Alberta, Department of Education. *Annual report*. Edmonton; Queen's Printer, 1951-1968.
- Richards, D. M. Availability and requirements for teachers in Alberta: 1971-1981. Unpublished doctoral thesis, The University of Alberta, 1971.

A. G. STOREY

Self Development in Adult Male Students in Relation to Success and Non-Success

This comparative study used five groups of subjects: (i) university males (successful), (ii) university males (unsuccessful), (iii) senior matriculation male high school graduates (successful), (iv) diploma male high school graduates (marginally successful), and (v) unsuccessful males who discontinued school before high school graduation. All of the 254 subjects responded to both the "i" and "w" forms of the Q-Tags instrument. Success was found to relate positively with affect and negatively with hostility. All groups showed strong wishes for greater effectiveness with corresponding decrement wishes for social involvement. (Dr. Storey is an Associate Professor of Educational Psychology at The University of Calgary.)

The aims of high school education are generally couched in terms of personal and social development. Bruner (1966) begins his theory of instruction with a claim for such objectives; Piaget (1962) implies the same aims. The *Alberta High School Handbook* (1966) like most other such documents fails even to mention academic achievement in outlining school aims. Apparently, then, the individual attends school in order that he might increase his stature in such areas as: (1) personal development, (2) growth in family living, (3) growth towards competence in citizenship, and (4) occupational preparation. However, when the student inquires as to how well he has succeeded in school, the response is always in terms of science, mathematics, English and other percentages. Furthermore, the some 75 per cent of Canadian pupils who are required to discontinue school before high school graduation (it matters little if the request is their own or the school's) find the withdrawal necessary not because they failed to "grow and develop" but because they did not learn a sufficient number of facts in areas such as science, mathematics, or English.

The current study constitutes but another enquiry (see Storey, 1967) into some of the personal, and through them, some of the social implications attributable, at least in part, to the school's curricula. If Coleman (1960) and other personality theorists are right, the school must accept

a large measure of the responsibilities for what the individual becomes, whether it wishes to limit itself to academic pursuits or not. The hypotheses tested by the present study were that (1) the five groups of male subjects studied will exhibit no significant intergroup differences in affective, assertive, effective, hostility, reverie, or social concern scores as measured by the *Q-Tags Personality Test*, (Storey, 1969) and (2) nor will these groups produce significantly different intragroup scores on the same factors as measured by the same instrument.

Subjects and Testing Procedure

The subjects for the current study consisted of: (1) a random sample of 42 successful second year university males, (2) all of the 32 unsuccessful ex-university students currently enrolled in a petroleum and chemical technologies course at a technical institute, (3) all of the 71 senior matriculation graduates (successful high school students who did not aspire to university) enrolled in the same technical institute and course, (4) all of the 58 diploma graduates (marginally successful high school students) enrolled in this technical institute and course, and (5) all 51 male school dropouts (mean school grade 9.1) registered in a prevocational academic upgrading course at the Calgary vocational training school.

Although ability and achievement scores were not available on any of the groups tested, it was assumed that there would be little difference in the ability ratings of Groups 1, 2, and 3. Group 4, it was expected, would score somewhat lower than the first three groups in ability while Group 5 would probably score below Group 4. Groups 1 and 3 were considered to be "success" groups while Group 4 was marginally successful. Groups 2 and 5 both experienced school failure though at different levels.

All of the subjects responded to both the "i" and "w" forms of the *Q-Tags* instrument. Form "i" of the test was administered first with form "w" following from three to seven days later. This time lapse between the "i" and "w" forms of the test was judged optimum in compromising between the subject's memory for card placement in form "i" and change in the phenomena measured before the administration of form "w". Table 1 summarizes the data obtained through the administration of these tests.

Treatment of Data

An analysis of variance treatment of the data given in Table 1 indicated that there were significant differences ($p < .01$) among the intergroup mean scores on the "i" form of the sort. The same technique revealed intragroup differences in "w" scores also. The t 's or critical ratios of these findings were determined in order to locate specific areas of difference. Table 2 gives the t 's of those differences found to be statistically significant. (A similar table for the "w" sort is not appropriate since the groups scored differently on the "i" sort and there was no common starting point from which to "wish").

It is to be noted that although some of the absolute differences available from Table 1 are very similar in magnitude, the "t's" between them are quite different owing to the influence of variances and sample sizes.

TABLE 1
MEAN Q-TAGS SCORES OBTAINED ON EACH GROUP

Test form	Factor	University		University dropouts		Matriculants		Diplomats		Cdn. Voc. Training	
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
i	affective	47.5	9.1	43.3	7.7	44.1	7.8	43.9	7.4	46.3	9.5
	assertive	59.0	6.7	61.3	9.3	60.8	8.0	60.6	7.4	59.4	7.4
	effective	54.0	10.8	58.3	9.0	56.3	8.0	57.4	8.1	53.9	10.0
	hostility	43.6	5.8	44.8	9.0	44.7	8.9	43.7	8.8	48.4	9.6
	reverie	52.4	7.7	52.3	8.7	52.6	8.2	55.3	7.9	52.0	9.0
	social	66.5	7.6	63.7	8.5	63.7	10.0	63.9	8.5	64.1	8.7
w	affective	52.4	7.6	45.5	8.7	46.9	7.7	46.0	7.4	49.2	6.6
	assertive	58.2	7.9	62.1	9.4	60.7	8.6	62.3	9.6	61.8	6.8
	effective	64.3	6.2	66.4	7.0	63.8	7.7	65.5	9.1	62.8	7.3
	hostility	45.3	6.5	46.8	8.9	46.9	8.4	45.3	8.6	48.0	8.1
	reverie	54.8	8.2	50.5	8.5	52.8	8.9	53.7	8.6	51.6	7.5
	social	49.5	7.0	53.6	6.0	52.1	8.9	51.3	9.4	50.5	8.5
"i" versus "w" coefficients of correlation		.38		.25		.21		.18		.14	
N		42		32		71		58		51	
Mean Age		20.1		22.1		20.4		20.11		20.1	

For example, the absolute difference between UDO and CVT groups on the "i" form of the test is 4.4, which proves to be statistically significant. The similar difference of 4.3 between UDO and successful university students is far from significant owing to the smaller N and larger variances in the case of the successful university group on the one hand, and the CVT group on the other.

The t ratios were also determined for the within groups "i" versus "w" mean scores. Table 3 presents the t's that were found to be significantly different from zero.

Discussion and Conclusions

An examination of the data given in Table 2 indicates that the successful university men scored significantly higher on the affective scale than did university dropouts, senior matriculants and grade XII diploma graduates. This finding would suggest that there is a positive relationship between academic success and affective involvement.

Although it was beyond the scope of the present study to determine which of these phenomena is cause and which effect, former studies utilizing the Q-Tags Test seem to suggest that academic achievement results from affective involvement.

TABLE 2
SIGNIFICANTLY DIFFERENT INTERGROUP "i"
SCORES REPORTED AS *ts*.

Factor	Group Comparison									
	University dropouts versus University dropouts	University dropouts versus Matriculants	University dropouts versus Diplomats	University dropouts versus Cdn. Voc. Training	University dropouts versus Matriculants	University dropouts versus Diplomats	University dropouts versus Cdn. Voc. Training	Matriculants versus Diplomats	Matriculants versus Cdn. Voc. Training	Diplomats versus Cdn. Voc. Training
affective	†2.15*	†2.03*	†2.11*	—	—	—	—	—	—	—
assertive	—	—	—	—	—	—	—	—	—	—
effective	—	—	—	—	—	—	†2.08*	—	—	†1.99*
hostility	—	—	—	†2.97**	—	—	—	—	†2.16*	†2.65**
reverie	—	—	—	—	—	—	—	—	—	†2.02*
social	—	—	—	—	—	—	—	—	—	—

Note: † indicates the group scoring significantly higher than other groups.

* significant at or above .05.

** significant at or above .01.

Both university dropouts and diploma graduates, the two groups with limited success, consider themselves to be more effective than the prevocational students who discontinued school before graduation, i.e. before any appreciable degree of success was achieved.

The prevocational men were found to be more hostile than successful university students, senior matriculants, or diploma graduates, a finding which suggests a positive relationship between lack of success and hostility for students at these levels.

Diploma graduates scored higher on the reverie scale than did any of the other groups, suggesting that “daydreaming” may have been a factor in limiting their success.

The data summarized in Table 3 reveal that both successful university and senior matriculation graduates wish for greater affective involvement with their environment than they now have. And, this in spite of the fact that the university group describes itself as more affectively involved than every other group except the prevocational one. Academic success, where these subjects are concerned, then, seems to bear a positive relationship to a wish for affective involvement.

All of the groups wish to be more effective, a finding consistent with the fact that they are all now continuing in school. A wish for greater effectiveness is, however, not a characteristic of all groups. A sample of jail inmates studied with the Q-Tags instrument showed the opposite to be true (Storey and Sainty, 1967). All groups taking part in the present study also expressed a differential wish in favor of decreased social in-

volvement, that is, each group described itself as being more socially involved than it wished to be. Q-Tags norm indicate that this is a characteristic of most male student groups. Female graduates, prisoners and other non-school groups differential wishes in favor of sociability as do successful Junior High School students (Storey and Clark, 1968).

TABLE 3
SIGNIFICANTLY DIFFERENT MEAN "i" VERSUS MEAN
"w" SCORES REPORTED AS *ts*.

Factor	University	University dropouts	Matriculants	Diplomats	Can. Voc. Training
affective	2.68**w	—	2.16*w	—	—
assertive	—	—	—	—	—
effective	5.36**w	4.02**w	5.69**w	5.06**w	5.13**w
hostility	—	—	—	—	—
reverie	—	—	—	—	—
social	10.66**i	5.49**i	7.34**i	7.45**i	7.98**i

* significant at or above .05;
i difference favors i means;
** significant at or above .01;
w difference favors w mean

In conclusion, then, the current study indicates that there may be measurable educational outcomes apart from academic achievement. It would suggest that affective involvement may be positively related to academic success at the adult level while hostility may be a by-product of non-success. It suggests further that strong wishes for effectiveness with corresponding wishes for a decrement in social involvement may be characteristic of adult male students regardless of their academic success or non-success. It seems that students exhibit personality characteristics and wish patterns peculiar to themselves. Further study may reveal that students at given ages and educational levels have personality characteristics and desires that differentiate them from non-students and from students at other ages and levels. It would seem also that an understanding of the possible outcomes of education in terms of such personality factors as those investigated here can be obtained through serious attempts to measure such outcomes.

References

Bruner, J. S. *Toward a theory of instruction*. Cambridge, Mass.: Bellknap Press, Harvard University, 1966.
Coleman, J. C. *Personality diagnosis and effective behavior*. Chicago: Scott Foresman, 1960.
Piaget, J. *Plays, dreams and limitations in childhood*. New York: Norton, 1962.

- Province of Alberta. *Senior high school handbook*. Edmonton: Department of Education, 1966.
- Storey, A. G. School acceleration and deceleration as a function of self concept. *The Alberta Journal of Educational Research*, 1967, 13.
- Storey, A. G., & Sainty, J. Personality characteristics of prisoners as compared to non-prisoners. *Canadian Journal of Corrections*, 1967, 9(4),
- Storey, A. G., & Clark, R. The self image and wish pattern of underachievers. *McGill Journal of Education*, 1968, 3(1),
- Storey, A. G. *The Q-Tags test of personality*. Montreal: Institute of Psychological Research, 1969.

CORRECTION

Our readers are asked to note the following error on page 37 of the March, 1972 issue of *AJER*:

The definition of Z_i should be $Z_i = \frac{X_i - U_i}{\sigma_i}$

ETHEL M. KING
and
DORIS T. FRIESEN

Children Who Read in Kindergarten¹

This study compared differences in family background, pre-school experiences, and selected variables associated with reading among the population of 31 readers attending Calgary Kindergartens and a sample of 31 randomly selected non-early readers. Achievement of the same subjects was compared after one year of reading instruction. Intelligence, visual discrimination, letter name knowledge, word recognition, and rate of learning to read new words were the most significant variables in distinguishing the two groups. After one year of instruction they differed significantly in oral word reading, vocabulary, and comprehension. Early readers came from higher socio-economic levels and smaller families, their mothers had more education, they spent more time in sedentary activities, and they received a variety of kinds of help. Within limitations, the findings suggest that reading programs should be adapted to stimulate early readers and to provide specific pre-reading instruction to the others in those factors which are associated with success in reading. (Dr. King is a Professor of Curriculum and Instruction in the Faculty of Education at The University of Calgary, and Doris Friesen is at the Learning Assistance Centre, Calgary.)

Most children today are better prepared for learning to read than ever before. They are exposed to a great many verbal symbols in their environment. Parents are becoming increasingly aware of the importance of providing pre-school educational experiences that contribute directly and indirectly to the ability to learn to read.

According to the Denver study (1966), "increasing numbers of children are able to do a little reading at the time they enter first grade." Some of them learn to read even earlier. Generally, these children have had no formal instruction, but presumably were ready to learn to read.

Little research has been reported on children who learned to read early. Reports of exceptional children, biographies, autobiographies, and case studies provide useful but incomplete descriptions of certain char-

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acteristics. The most important research on early readers was two related longitudinal studies undertaken by Durkin (1966).

In the first study, initiated in a California school system in 1958, less than one percent of children beginning grade one were identified as readers. Three years later a similar study, conducted in selected New York schools, identified 3.5 percent of the pupils as early readers. Those children who started reading earlier were significantly superior in reading achievement after six years of school instruction when compared with classmates of the same mental age who did not begin to read until grade one. While early readers as a group had a high median IQ (121 in California and 133 in New York), the range of IQ scores was from 91 to 161 in the first study and 82 to 170 in the second study. A number of traits and characteristics of the children were studied by means of home interviews, teacher rating scales, and tests. Differences were found in family backgrounds, particularly in the attitudes of parents and the influence of older siblings.

Since children begin reading in English at varying ages and some are entering school elsewhere with reading competency, it was assumed that a sample of early readers could be located in the area, even though some characteristics of the population would differ from those of related studies. Hypothesizing that the identification of unique characteristics of these children would be advantageous for the development of pre-reading programs, a study was planned on kindergarten readers.

Specifically, can we differentiate kindergarten readers from non-readers on the following variables: sex, age, intelligence, vocabulary, listening comprehension, following directions, auditory discrimination, auditory blending, visual discrimination, visual-motor coordination, knowledge of letter names, word recognition, and rate of learning to read new words? In addition, are there any differences in the family backgrounds and learning experiences of kindergarten children who had achieved some measure of success in learning to read and those who had not? After a year of school instruction, it is possible to differentiate the early readers from the non-early readers on vocabulary, comprehension, and word recognition? What kinds of adjustments are made in the instructional program for children who have some reading ability?

Design of The Study

Subjects

The subjects were selected from the population of 4,282 children attending Community and Public School Kindergartens in Calgary, Canada. The children attended kindergarten from 2 to 2½ hours a day, either in the morning or afternoon. In total, there were 144 classes taught by 109 teachers as 35 teachers taught both a morning and afternoon session. Enrollments varied from 14 to 37.

The kindergarten teachers listed on a questionnaire 104 children as possible readers. These subjects were given a standardized oral reading test. Only two were not tested because one child moved and parental consent was not given for a very emotionally disturbed child. Of the 102 subjects tested, 31 were identified as readers, according to the criteria established

for this study, and thus constituted a population of the readers in the Calgary Community and Public School Kindergartens. An equivalent number of subjects who could not read was selected randomly from the same kindergarten classes. In the group of early readers there were 11 boys and 20 girls. In the group of non-early readers there were 21 boys and 10 girls.

After one year of instruction in school, only 27 of the early readers and 28 of the non-early readers remained in the Calgary Public and Separate Schools. There were 11 boys and 16 girls in the group of early readers and 19 boys and 9 girls in the group of non-early readers (Table 6).

Materials and Procedures

The study was designed in four main parts: identifying readers, obtaining information from parents, assessing the abilities of the subjects, and evaluating the reading progress of the subjects after one year of school instruction.

Identifying Readers. All kindergarten teachers received a letter two months before the end of term explaining the purpose of the study and enlisting their support in completing a questionnaire. After a reminder call, the total of 109 forms were returned. The purpose of the questionnaire was to identify possible readers in attendance at kindergartens. Because of the difficulty in defining a "reader" at this level, gross categories were provided on the questionnaire so that teachers could list names under the most appropriate description: (1) reads name and other isolated words in the classroom, (2) reads words that have not been directly taught in the class, (3) reads simple stories, and (4) reads a whole book at the grade one level or higher. The first category did not discriminate readers from non-readers as almost all subjects could read at this level in the spring. The Word Recognition and Word Analysis subtest of the *Durrell Analysis of Reading Difficulty* was then administered to all pupils listed in the last three categories to determine a reading grade level.

Subjects were considered to be readers if they met the two criteria established for this study: assessment by a teacher of the ability to read words, stories, or a book not taught in class, and assessment by a standardized test of the ability to read at a grade one level or higher.

Obtaining Information from Parents. The parents of the population of kindergarten readers and the parents of the sample of kindergarten non-readers were sent a questionnaire. Many items common to both questionnaires requested information on the parents, other adults, siblings, languages spoken, child's activities, child's previous group learning experiences, handedness, and relevant pre-reading activities. Some additional questions were included in the form to the parents of readers which solicited information on the beginning age, interest in reading, and the kind of help provided to the child. Parents were encouraged to discuss any items with the investigators.

Assessing Pupils' Abilities. Three kinds of standardized tests were used in assessing the abilities of the subjects: a group intelligence test, a group reading readiness test, and an individual learning rate test.

The mental abilities test administered was the *Lorge-Thorndike Intelligence Test*, Level 1, Kindergarten and Grade One. This test provides

an IQ score and one of the subtests provides a vocabulary score which was considered an important variable in this study. The *Gates-MacGinitie Readiness Skills Test* for Kindergarten and Grade I consisted of eight subtests: listening comprehension, auditory discrimination, visual discrimination, following directions, letter recognition, visual-motor coordination, auditory blending, and word recognition. The other readiness test used was the Learning Rate subtest of the *Murphy-Durrell Reading Readiness Analysis*.

The early readers and non-early readers in each kindergarten were tested together for the group tests in a room apart from the regular classroom. Groups were determined initially by the number of readers in any particular kindergarten and then doubled when the randomly selected non-readers were added. The size of the groups being tested varied from two to six. In administering the tests, one half of the subjects were given the *Lorge-Thorndike Intelligence Test* one day and the *Gates-MacGinitie Reading Readiness Test* on the second day. The order of administration was reversed for the other half of the subjects so that the experience of writing tests would affect the scores on both tests equally. Finally, the Learning Rate subtest of the *Murphy-Durrell Reading Readiness Analysis* was administered to all subjects on an individual basis.

Evaluating Progress After One Year. Additional information was obtained on the subjects who were still resident in Calgary after one year of attendance in school by means of a teacher's questionnaire and a standardized reading achievement test.

The questionnaire sent to grade one teachers contained five sections relating to the pre-reading program: reading program, reading skills, reading interests and habits, and traits and attitudes of the pupils. Since the range of reading achievement scores could be expected to be large for the subjects, a decision had to be made in selecting a test that would be appropriate for grade one children and yet provide for those who were capable of scoring much beyond that level. Three forms of the *Gates-MacGinitie Reading Test* were used; Primary A which provides reading grade scores ranging from 1.3 to 3.5, Primary B from 1.2 to 5.2, and Primary C from 1.3 to 7.1. All kindergarten non-readers and kindergarten readers who had scored below grade 2.5 on the Word Recognition and Word Analysis Test of the *Durrell Analysis of Reading Difficulty* were given Primary A. Readers who had scored between 2.6 and 3.5 were given Primary B, and those who scored above 3.5 were given Primary C.

Results

Information obtained from the questionnaires to parents related to family background and child's preschool experiences. The data on another problem, the differentiation of early readers from non-early readers on selected variables, were gathered from test results and analyzed statistically. The main statistic used was a multiple discriminant analysis. A classification matrix was derived and an intercorrelation matrix on selected variables was obtained for kindergarten readers and non-

readers. Chi-square was also used in some of the tests of significance. The outcome was considered significant if the probability level was <.05.

The statistical analyses were repeated on the subjects remaining in the study after one year of instruction in school and with reading achievement scores added as variables. Information obtained from the questionnaire to teachers in the follow-up study was summarized.

Family Background

Information on the birthplace, education, socio-economic status, and number of children, obtained from the parents of the subjects, is summarized in Table 1.

TABLE 1
FAMILY BACKGROUND OF KINDERGARTEN READERS
AND KINDERGARTEN NON-READERS

Family Background	Kindergarten Readers n = 31		Kindergarten Non-Readers n = 31	
Parents' Birthplace	Father	Mother	Father	Mother
Canada	23	26	23	21
U.S.A.	2	2	0	0
Other Countries	6	3	8	10
Parents' Educational Attainment	Father	Mother	Father	Mother
University degree	13	7	7	6
Grade 12 & other training	5	4	9	7
Grade 10-12	9	19	10	14
Grade 7-9	4	1	5	4
Socio-Economic Level (Blishen Socio-Economic Index)				
70 and up		10		5
60 - 69		6		9
50 - 59		7		9
40 - 49		4		5
30 - 39		4		3
Below 30		0		0
Number of Children (including subject)				
1		2		1
2		14		8
3		12		15
4		2		4
5 - 11		1		3
<u>X</u>		<u>2.6</u>		<u>3.2</u>

The difference between the observed and expected educational attainment of parents of the two groups was tested using Chi-square. There was no significant difference in the father's educational attainment ($\chi^2 = 4.68$) but the differences between the educational attainment of the mothers ($\chi^2 = 7.84$) was significant at the .05 level.

The occupation of the father was used to determine the socio-economic index for the families of the subjects. The scale used was "A Socio-Economic Index for Occupations in Canada" (Blishen, 1967). This index was developed by using the income and education as reported in the 1961 Census of Canada and prestige scale scores from the Pineo-Porter scale for 320 occupations in Canada (1967).

Chronological ages were not significantly different between the groups; 71.22 months for early readers and 71.00 months for non-early readers. Eleven of the readers were the oldest child in the family and 18 had older brothers and sisters. Nine of the kindergarten non-readers were the oldest in the family and 20 had older brothers and sisters.

In all families but one, both mother and father were living in the home. The father was the only parent living at home with one of the early readers but, in this case, information was also obtained from the mother. Only two families had an adult other than the parents living at the home; a grandfather in one case and an uncle in the other.

In the homes of five early readers there was a language other than English spoken and four of the subjects also spoke that language. Six children who had not yet learned to read came from homes where a language other than English was spoken and three of them spoke that language.

Pre-School Experiences

Information obtained from the parents on the pre-school learning experiences of the subjects included: motor skills, verbal skills, nursery school and day-care center attendance, interests, and activities.

No significant differences were reported in the ages (in months) at which the two groups began walking and talking.

	Kindergarten Readers		Kindergarten Non-readers	
	mean	range	mean	range
Began walking	11.8	9-15	11.7	7.5-15
Began talking	15	8-24	15.8	8-30

Among the early readers, six (19.3 per cent) were predominantly left-handed while only one (3.2 per cent) in the other group was left-handed.

Four readers and six non-readers had attended nursery school for one or two years and one non-reader had also been to day-care center for a year.

Preferred activities, as listed by the subjects, are reported in Table 2.

Television viewing was mentioned as a favorite activity for only four children in each group, but all except one child watched some television each week. According to the parents, the amount of time children spent watching television varied with the season; winter ranking highest. For the early readers, the average time spent viewing television was 9.0 hours per week; for the kindergarten non-readers, it was 10.2 hours.

Almost all the children had access to easy reading material in the home. Some parents mentioned having extensive book collections for children.

TABLE 2
PREFERRED ACTIVITIES OF KINDERGARTEN READERS
AND KINDERGARTEN NON-READERS

Activities	Kindergarten Readers	Kindergarten Non-readers
Outdoor active play	25	30
Handwork (drawing, coloring painting, printing)	32	16
Quiet games (cards, checkers)	11	6
Playing with toys	1	5
Listening to stories	2	15
Looking at books, magazines	3	8
Construction activities (blocks, paper, wood)	6	9
Reading	13	n.a.
Playing School	5	0
Watching television	4	4
Miscellaneous (dramatic play, music, camping)	17	11

Of the readers, 21 were read to regularly, five irregularly, and five not at all. For the other group, 21 were also read to regularly, three often and seven not at all. Greater differences were found in visits to the library; 19 early readers contrasted to 11 non-reading kindergartners visited public libraries.

Kindergarten Readers

The 31 readers, tested on an oral word reading test, ranged in achievement from low grade 1 to high grade 5.

Parents reported a range of ages from 2.5 to 5 years when their children began showing an interest in reading and a range from 3 to 6 years when the children actually began reading. Twenty-six of the subjects had received some help in learning to read at home, four had received very little help, and one had no help. The greater part of the help was received from the mother for 11, from the father for three, from both parents for seven, and from grandparents for two of the subjects.

According to the parents, the assistance provided in the home was mainly specific word knowledge: teaching letter sounds (14 cases), teaching letter names (11 cases), and telling the child a specific word on request (11 cases). Others reported a variety of kinds of assistance, such as printing words for the children (four), using commercial materials (four), answering questions (three), vocabulary training on words while reading to the child (two), observing the child playing school with older children (one), and encouraging the child to print words (one).

Data on Selected Variables

A multiple discriminant analysis was used to determine whether or not the kindergarten readers could be differentiated from the non-readers on selected variables: vocabulary, listening comprehension, following directions, auditory discrimination, visual discrimination, visual-motor coordination, letter recognition, auditory blending, word recognition, and rate of learning new words. In addition to these 10 specific skills, intelligence, sex, and chronological age were other variables analyzed.

The value of the generalized Mahalanobis D^2 statistic was 382.03. Using this value to test the overall significance of the mean values in the two groups for the 13 variables, the critical value of Chi-square is 32.91 at the .001 level. Thus, the observed D^2 value is highly significant and indicates that the early reader group performed differently from the non-early reader group in relation to the 13 variables.

In the classification matrix, all 31 early readers fit into Group I and were correctly classified as such. In Group II, two non-early readers were incorrectly classified and showed characteristics similar to that of the reader group. The other 29 non-early readers were correctly classified as such.

Data on Selected Variables After One Year of Instruction

A multiple discriminant analysis was repeated on the selected variables from the first part of the study for those subjects remaining after one year of school instruction. In addition, three new variables were added for each group: scores on oral word reading, vocabulary, and reading comprehension.

The revised value of the generalized Mahalanobis D^2 statistic was 402.03 on the 13 scores of the subjects remaining in the study. This was still highly significant. With the additional variables added after one year, the generalized Mahalanobis D^2 statistic was 627.82 which is also significant.

The revised classification matrix for subjects from the first part of the study who continued through one year of school instruction indicated that one of the non-reading kindergarten subjects who was classified incorrectly in kindergarten was lost to the study. Of particular importance, however, was the fact that pupils who had learned to read early all fit correctly into the classification as did those who had not learned to read early in kindergarten when compared after one year of school instruction.

Table 3, which presents means, standard deviations, and the intercorrelation matrix for early readers, includes only subjects remaining in the study after one year of reading instruction. The first 13 variables were data obtained at the end of the kindergarten year. In addition, variable 14, an oral word reading test in year 1, was administered to the kindergarten readers only. The remaining three variables were scores obtained after a year of reading instruction. Sixteen correlations were significant at the .05 level.

The means, standard deviations, and intercorrelation matrix for non-early readers are presented in Table 4. Again, the first 13 variables were

TABLE 3
MEANS, STANDARD DEVIATIONS, AND INTERCORRELATION MATRIX FOR EARLY READERS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	—	.121	.014	.105	-.185	.231	.223	.065	-.038	.093	-.228	.267	.381+	.189	.308	.329	.073
2		—	.295	.380	.366	.061	.437+	.404+	.098	.314	.338	.201	.124	-.036	.174	.280	.323
3			—	.491*	.471+	.377	.318	.428+	.214	.223	.015	.230	.103	-.099	.198	.277	.227
4				—	.231	.378	.312	.487+	-.039	.247	.255	.177	.044	-.134	.088	.324	.102
5					—	.323	.390+	.259	.359	.550*	.215	.377	-.008	.015	.082	.199	.260
6						—	.459+	.277	.228	.142	-.142	.339	.209	.097	.164	.308	.079
7							—	.430+	.327	.433+	.219	.748*	.553*	.351	.397+	.452+	.203
8								—	.132	.164	.289	.424+	.229	.046	.464+	.600*	.473+
9									—	.186	.033	.433+	.474+	-.049	.049	.106	-.045
10										—	.169	.556*	.269	.148	.213	.213	.163
11											—	.115	-.084	-.043	.051	.185	.159
12												—	.620*	.422+	.646*	.547*	.294
13													—	.479+	.511*	.560*	.185
14														—	.550*	.591*	.385+
15															—	.811*	.792*
16																—	.625*
17																	—
Mean	—	71.22	111.11	16.85	14.41	20.30	21.48	12.19	17.67	13.93	12.85	23.26	17.33	30.74	70.78	42.63	42.26
s.d.	—	2.85	9.89	1.88	3.05	0.90	2.27	1.12	0.67	3.09	1.11	1.45	1.05	25.09	12.59	8.74	9.45

+ Significant at .05 level
* Significant at .01 level

TABLE 4
MEANS, STANDARD DEVIATIONS, AND INTERCORRELATION MATRIX FOR NON-EARLY READERS

	1	2	3	4	5	6	7	8	9	10	11	12	13	15	16	17
1	—	.122	-.135	.043	.227	-.056	-.367	.006	-.025	-.097	-.364	-.232	-.197	.249	-.222	-.141
2		—	-.546*	-.287	-.143	-.302	-.171	-.534*	-.240	-.127	-.356	-.194	-.059	-.089	-.416+	-.317
3			—	.761*	.433+	.593*	.457+	.698*	.444+	.141	.458+	.436+	.229	-.046	.421+	.445+
4				—	.405+	.545*	.241	.535*	.327	.015	.154	.261	.279	.005	.335	.305
5					—	.474+	.283	.372	.108	.318	.247	.076	.109	-.286	.333	.047
6						—	.461+	.648*	.413+	.329	.558*	.448+	.441+	.246	.654*	.498*
7							—	.329	.405+	.570*	.493*	.530*	.433+	.051	.468+	.460+
8								—	.525*	.065	.623*	.403+	.127	.042	.506*	.464+
9									—	.125	.439+	.626*	.587*	.116	.539*	.625*
10										—	.325	.387+	.121	.019	.367	.161
11											—	.618*	.331	.027	.603*	.507*
12												—	.627*	.261	.303	.369
13													—	.344	.255	.225
15														—	-.094	.005
16															—	.749*
17																—
Mean	—	71.00	100.79	14.96	12.29	19.61	14.50	10.36	10.00	10.89	9.79	8.04	8.00	12.32	38.21	21.71
s.d.	—	3.14	12.95	2.97	3.18	2.11	5.31	2.66	6.11	3.13	2.72	4.52	3.50	7.33	8.63	7.89

data obtained at the end of the kindergarten year for those subjects who remained in the study for another year. The three additional variables were measured after a year of reading instruction. Twenty-six correlations were significant at the .01 level and 22 additional correlations were significant at the .05 level.

First Year of Reading Instruction

Teachers reported using a great variety of beginning reading materials with both groups and some pre-reading materials with the non-early readers. The kinds of adjustments made in the instructional program for those who had achieved some competency in reading were of three main types: advancement to a higher reading achievement group, enrichment activities, and individualized instruction in reading. Only three teachers reported no adjustments in the program for the early reading subjects in this study. On the other hand, teachers of the non-early readers reported that a great variety of corrective instruction was required for these pupils. Only two from this group were assigned to the highest achieving reading group in the classroom after one year of instruction.

Teachers reported no significant differences between the groups in pupils volunteering to read orally but did rate the early readers significantly higher than the non-early readers in both silent and oral reading ability. The major strengths of the early readers were attributed to good comprehension and word recognition skills, according to the teachers. Early readers chose reading as a preferred activity more frequently than their classmates. As expected, reports indicated they read more books independently, although accurate records were not kept. The mean number of books read independently during the first year of school was estimated to be 41 for early readers and 30 for non-early readers.

In response to the questionnaire items on abilities and traits, the teachers presented somewhat different profiles of pupils who were early readers and those who were not, as shown in Table 5.

Discussion

Slightly less than one per cent of the Community and Public School Kindergarten pupils in Calgary were identified as readers. Almost all of these early readers had some informal help in learning to read from members of their families, but had not received reading instruction in the kindergarten program.

The factors in the family background which appeared to be most important were the mother's educational attainment and the father's occupation. Mothers of early readers achieved a significantly higher level of education than the mothers of non-early readers. The socioeconomic index was higher and the average family size was smaller for kindergarten readers when compared to non-early readers.

As a group, the early readers were more intelligent, with an average IQ of 111.11 and a range of scores from 91 to 132. The others had a mean IQ of 100.79 with a range from 62 to 120. Little difference was found between the two groups in the ages at which they began to walk and talk. However, there was a considerably greater number of left-

TABLE 5
 ABILITIES AND TRAITS OF SUBJECTS AFTER
 ONE YEAR OF READING INSTRUCTION

Abilities and Traits	Early Readers n = 27	Non-early Readers n = 28
Mental ability		
Bright	24	10
Average	3	18
Dull	0	0
Memory		
Good	24	14
Average	3	14
Poor	0	0
Challenging task		
Is persistent	13	8
Makes some attempt	12	13
Gives up easily	2	7
Work habits		
Careful	17	9
Average	8	12
Careless	2	6
Omission		1
Self-reliance		
Independent	15	8
Average	11	12
Dependent	1	8
Attentiveness		
Concentrates well	16	8
Attends adequately	10	12
Easily distracted	1	8
Curiosity		
Very curious	10	6
Average	17	20
Indifferent	0	2
Speaking Vocabulary		
Extensive	16	3
Average	11	22
Limited	0	3
Expression of ideas		
Good	19	9
Average	7	15
Poor	1	4

handed early readers than non-early readers. Sedentary activities, such as handwork and quiet games, were favored by the kindergarten readers, although they tended to watch less television than the others.

On the variables analyzed by a multiple discriminant analysis, the readers and non-readers in the kindergarten formed two distinct groups.

Intelligence, visual discrimination, letter recognition, word recognition, and rate of learning to read new words were the variables most important in differentiating between the two groups. In the intercorrelation matrix for early readers, the reading level attained by the subjects at the end of the kindergarten year (variable 14), correlated significantly with word recognition and rate of learning to read new words, the two factors that were found to be the best indicators of early reading achievement. The selected skills for non-early readers appear more intercorrelated and less differentiated than for early readers. Also, the reading skills appear as a unitary-type ability for non-early readers and for the readers the particular skills are more distinct and differentiated.

After one year of reading instruction, this small group of early readers possessed certain characteristics that still made them distinguishable from their classmates. The second oral word reading test, used to determine reading level, correlated significantly with visual discrimination, following directions, auditory blending, learning rate, and the word reading test administered the previous year. All three tests administered at the end of a year of school instruction, oral word reading, vocabulary, and comprehension, were significantly correlated for the early readers, whereas only vocabulary and comprehension were highly correlated for the non-early readers. It is also interesting to note that vocabulary and comprehension correlated significantly with the ability to follow directions the previous year for both of the kindergarten groups.

Of particular importance was the growth which early readers made on the oral word reading test, one of the criterion measures used in identifying them in the kindergarten. When the test was repeated after one year of reading instruction the mean of the scores increased from 30.74 to 70.78. For those children who had not learned to read early the mean of the scores on the same test was 12.32 with a range of 2 to 34 compared to the mean of 70.78 and a range of 44 to 88 for the early readers. Not only did the kindergarten readers have initial success but certain factors interacting with the instructional program yielded a

TABLE 6
SEX DISTRIBUTION

	Year 1			Year 2		
	Boys	Girls	Total	Boys	Girls	Total
Early Readers	11	20	31	11	16	27
Non-Early Readers	21	10	31	19	9	28
Total	32	30		30	25	

highly significant gain in reading achievement. The non-early readers after nearly a year of reading instruction, as a group, had not achieved a mean score on the oral word reading test even approaching the mean score of the early readers *before* the latter had received any formal instruction.

The findings of this study must be interpreted with due consideration for certain limitations. An arbitrary definition of a "reader" at this level is not entirely satisfactory. The number of subjects identified as readers was small. Although it was a city population of kindergarten readers, some children who read early may not have attended kindergarten and thus would not have been included in the study. Other than city-wide directives to kindergarten teachers, there was little control in the interaction of factors in the kindergarten program and the factors in the home situation which contributed to early success in reading. Similarly, the possible effects of experiences during the summer recess have not been investigated. The number of variables and the duration of the study were, of necessity, limited.

Within these limitations, some practical implications are suggested from this study and related studies in other countries. As the number of children receiving kindergarten instruction is growing it is increasingly important for kindergarten teachers to identify those pupils who are learning to read early. Information from this study suggested that teachers frequently underestimated the progress of pupils, probably because they were not involved in the formal teaching of a pre-reading program. Teachers receiving early readers at subsequent levels should be alerted so that instruction may be adapted to take advantage of the early start and to provide a well articulated developmental program. Since those who read early usually maintain an advantage, programs should become increasingly flexible to provide the maximum amount of stimulation.

Children reportedly are interested in reading or reading-related activities, such as listening to stories long before school and even kindergarten age. The effects of stimulating certain kinds of pre-reading experiences in the home setting have not been studied as rigorously in Canada as they have been, for example, in Japan.

Although some children read sooner than others there is no reason to assume that reading instruction should be advanced to an earlier age for all children. Some factors associated with early success, such as intelligence, may be stimulated but cannot be taught in a manner comparable to specific reading skills. However, for those skill areas that have already been identified as being significantly related to reading success we can at least work to do an increasingly better job of teaching them. These skills include visual discrimination, letter recognition, word recognition, and listening to and following directions.

The effects of new trends and changing emphases must be constantly appraised. What effects are new television programs having on the acquisition of reading skills? What effects are para-professionals having on reading success factors? What effects are programs that involve adults from the community having on pre-schoolers?

Children Who Read in Kindergarten

References

- Blishen, Bernard R. "A Socio-Economic Index for Occupations in Canada." *Canadian Review of Sociology and Anthropology*, IV, No. 1 (Feb., 1967), 41-53.
- Cooley, William W. and Lohnes, Paul R. *Multivariate Procedures for the Behavioral Sciences*. New York: John Wiley and Sons, 1962.
- Durkin, Dolores. *Children Who Read Early*. New York: Bureau of Publications, Teachers College Press, Columbia University, 1966.
- McKee, Paul; Brzezinski, Joseph; and Harrison, M. Lucille. *The Effectiveness of Teaching Reading in the Kindergarten*. Denver, Colorado: The Denver Public Schools, 1966.
- Pineo, Peter C. and Porter, John. "Occupational Prestige in Canada." *Canadian Review of Sociology and Anthropology*. IV, No. 1 (Feb., 1967), 20-40.

K. MARJORIBANKS

Achievement Orientation of Canadian Ethnic Groups

Research has indicated that the differential rates of occupational mobility that exist among ethnic groups are related to ethnic group inequalities in achievement orientation and intelligence. In the present study an examination is made of the interrelationships among the constructs of ethnicity, social class, achievement orientation, and intelligence. The sample included families, classified as middle class and low class, from five ethnic groups, residing in Ontario. In general it was found that Jewish and white Anglo-Saxon Protestant groups, which are over-represented in the upper levels of the Canadian occupational hierarchy, had above average achievement orientation and intelligence test scores. Franco-Ontarian and Southern Italian groups, which are over-represented in the lower levels of the occupational hierarchy, had a combination of either average or below average achievement orientation and intelligence test scores. Canadian Indians (Iroquois), who are largely concentrated in the lower levels of the Canadian occupational hierarchy, were found to exhibit below average achievement orientation and intelligence test scores. The results tend to support predictions made from a review of old culture studies and recent empirical investigations of the ethnic groups. (Dr. Marjoribanks is a Lecturer in Sociology of Education, the Department of Educational Studies, University of Oxford, England.)

Introduction

The Canadian social structure is characterized by a disproportionate representation of ethnic groups in the various levels of the occupational hierarchy (Porter, 1965). For example, census data indicates that the ethnic groups classified as British and Jewish are over-represented in the upper levels of the hierarchy and under-represented in the lower levels. The French Canadian and Southern Italian groups exhibit a reverse pattern, being under-represented in the upper levels of the hierarchy and over-represented in the lower levels; the Canadian Indian group is largely concentrated in the lower levels of the occupational hierarchy.

Research has indicated that two factors associated with the formation of an occupational hierarchy are intelligence and achievement orientation. Duncan (1968) found, for example, that intelligence test scores accounted for more of the variance in both educational and occupational achievement, of young white American males, than did father's occupation, father's education, or number of siblings. In an examination of longitudinal data in Sweden, Husen (1968) found that intelligence was significantly related to occupational achievement, and from a review of research studies, Lipset and Bendix (1958) also concluded that intelligence was an important factor in accounting for occupational achievement.

They also suggested that occupational achievement is associated with factors which intensify the involvement of a child with his parents and which reflect an orientation towards achievement.

In the present study an investigation was made of the extent to which a number of Canadian ethnic groups, which differ in their position in the occupational hierarchy, also differ in their orientation towards achievement. The interrelationships among the constructs of ethnicity, social class, achievement orientation, and intelligence were also examined.

Theoretical Framework

The theoretical framework adopted for the study, which is presented in Figure 1, is an extension of the theoretical models developed by Sewell and Shah (1967), Duncan (1968), Duncan and Duncan (1968), Rehberg et al. (1970), and Alwin and Mueller (1971).

FIGURE 1

Theoretical Model Linking Ethnicity, Social Class, and Occupational Achievement



Note: Ethnicity and social class are also connected directly with both educational achievement and occupational achievement.

The primary concern of the present study was to investigate the linkage between the constructs of ethnicity and achievement orientation. In the study the five ethnic groups mentioned earlier were examined: Jewish, white Anglo Saxon Protestants, French Canadians (Franco-Ontarions), Southern Italians, and Canadian Indians (Iroquois).

The following review of 'old culture' studies and of recent empirical investigations of the five ethnic groups was made to establish propositions regarding the nature of the relationship between ethnicity and achievement orientation.

Ethnicity and Achievement Orientation

In the United States, Rosen (1959) found that Jewish and white Anglo Saxon Protestant parents exerted a significantly stronger orientation towards achievement in the rearing of their children than did French Canadian or Southern Italian parents. Similarly, Lenski (1961) found that Jews and white Protestants identified themselves with the individualistic-competitive patterns of thought and action which are historically associated with the Protestant ethic. By contrast, Catholic groups were more often associated with the collectivistic-security oriented patterns of thought and action historically opposed to the Protestant ethic and the spirit of capitalism. Herberg (1960), Glazer and Moynihan (1963), and Strodbeck (1958) all suggest that, unlike other immigrant groups in North America, Jewish parents showed, from the date of their arrival, a passion for education unique among ethnic groups.

In another comparison which involved the study of Jewish and Southern Italian groups, Gans (1962) proposes that, because of their high valuation of education the Jews, unlike the Southern Italians, do not restrain their children from pursuing careers that might eventually draw the children away from the family. Gans also suggests that many Italian-American boys fail to respond to education due to a lack of motivation from parents. He suggests that this response is related to the parental ambivalence about the usefulness of education, and also to the absence of books and other intellectual stimuli in the home.

A set of studies by Fortin (1964), Gérin (1964), and Miner (1939) which have examined rural parishes in early Quebec, suggest that the French Canadian family was often indifferent and even hostile towards the development of education. Gérin indicates, for example, that in the rearing of his children, *the habitant* "does not emphasize individual effort as is done in a 'particularistic' society, . . . , he neglects education too much, particularly education of the elementary and practical order which would be indispensable to him in climbing the social ladder".

In the Report of the Royal Commission on Bilingualism and Biculturalism (1968), an examination was made of the intellectual test performance of Franco-Ontario students, students from Anglophone homes, and students from homes where neither English nor French was the main language. It was found that on all tests, the performance of the Francophone students was significantly poorer than the performance of the other two groups. While socioeconomic factors accounted for part of the poorer performance of the Franco-Ontario students, these factors did not provide a full explanation. An examination of the parental plans for education, as perceived by the students, indicated that the Franco-phone parents had slightly lower expectations for their children than did other parents in the study. The Francophone parents also had different plans for post-secondary education. A higher proportion of the parents in

the Francophone group saw some kind of vocational training or a job as the next step after school, rather than a university education.

From his examination of Canadian Indians, Vernon (1966) suggests that their way of life is characterized by a passivistic-collectivistic-present orientation, which is in opposition to the orientations which have been found to be associated with occupational achievement. In an investigation of Indian communities in Southern Ontario, Dilling (1965) suggests that the Indian seeks to perpetuate his culture and traditions and that his accommodation to the dominant culture has implications which are different from those of other minority groups. Dilling proposes that the level of aspiration is an area of conflict between the Indian culture and that of the Anglo Saxon. An important feature of the Canadian Indian family structure, which is likely to affect achievement orientation, is family size. Research suggests that the size of the family group influences the patterning of interactions and relationships among its members such that the level of involvement in educational activities between adults and children is likely to be reduced as family size increases. Census data indicates that of all the ethnic groups in Canada, the Indian group has the largest average family size.

From the studies which were examined, the following hypothesis was proposed for investigation:

The achievement orientation of Jewish and white Anglo-Saxon Protestant families is significantly greater than the achievement orientation of Franco-Ontarian, Canadian Indian (Iroquois), and Southern Italian families.

Method

Achievement Orientation

As indicated earlier, Lipset and Bendix suggest that occupational achievement is associated with factors which intensify the involvement of a child with his parents. In the present study four such factors were isolated: (1) press (Murray, 1938) for activeness, which seeks to establish the extent and content of both indoor and outdoor activities engaged in by the family, (2) press for intellectuality, which refers more specifically to the academic nature of the interaction between parents and children, (3) press for English, which seeks to measure the nature and quality of the linguistic involvement of the child with his parents and other members of the family, and (4) press for achievement, which refers to the extent to which parents value and reward educational activities.

Thus achievement orientation was defined in terms of: (1) press for activeness, (2) press for intellectuality, (3) press for English, (4) press for achievement.

Each of the achievement orientation factors was defined in terms of a set of characteristics which were believed to be the behavioural manifestations of the factors. The results of studies by Dave (1963), Wolf (1964), Plowden (1967), and Weiss (1969), were used to select the characteristics associated with each factor. In these latter four studies, attempts were made to isolate elements of the parent-child interaction process which

would be related to both cognitive and affective characteristics of the child.

The characteristics listed in Table 1 facilitated the development of an instrument for the study which was used to gain a measure of achievement orientation. The instrument, in the form of a home interview schedule,

TABLE 1
THE ACHIEVEMENT ORIENTATION FACTORS AND THEIR RELATED
CHARACTERISTICS

Achievement Orientation Factor	Characteristics
1. Press for Activeness	1a. Extent and content of indoor activities 1b. Extent and content of outdoor activities 1c. Extent and purpose of the use of T.V. and other media
2. Press for Intellectuality	2a. Number of thought-provoking activities engaged in by children 2b. Opportunities made available for thought-provoking discussions and thinking 2c. Use of books, periodicals, and other literature
3. Press for English	3a. Language usage and reinforcement 3b. Opportunities available for language (English) usage
4. Press for Achievement	4a. Parental expectations for the education of their child 4b. Social press 4c. Parent's own aspirations 4d. Preparation and planning for child's education 4e. Knowledge of child's educational progress 4f. Parental interest 4g. Valuing educational accomplishments

was used to elicit responses both from mothers and fathers. Because of the complexity and the subtlety of the achievement orientation factors that were to be measured, it was considered desirable not to limit the interviewers and respondents to a completely fixed alternative item schedule. However, because it was also considered desirable to have as interviewer for each ethnic group a member of that ethnic group, it was decided that a completely open ended item schedule might reduce the reliability of the instrument. Therefore a semi-structured interview schedule was developed.

In the schedule a set of alternative responses for each question was provided for the guidance of the interviewer. In addition, an 'other answer' space was provided for each question so that the interviewer could record a response not covered by those supplied.

A set of items was constructed to obtain a measure of each of the achievement orientation characteristics. In order to score each item, a six point rating scale was developed. The score for each of the orientation factors was obtained by summing the scores on the relevant characteristics.

Intelligence

Intelligence was operationalized by the scores on the SRA Primary Mental Abilities test. As well as providing a set of multifactored scores, the test provides a total ability score.

Sample

Families from five ethnic groups residing in Ontario were examined. The groups were Canadian Indian (Iroquois), French Canadian (Franco-Ontarions), Jewish, Southern Italian, and white Anglo-Saxon Protestant. In each case the family had at least one 11 year old (Canadian born) boy attending school. Except for the Canadian Indians, who were from one reserve, the ethnic groups resided in urban centres. The Jewish parents sent their 11 year old sons to Hebrew schools, and the French Canadian and Southern Italian parents sent their sons to Roman Catholic schools. In the schools attended by the French Canadian boys a strong French studies curriculum was offered as well as a regular English studies program.

Approximately 100 families from each ethnic group were selected for the study. Where possible, two parallel pools of 40 families were formed within each ethnic group. Within the pools the families were assigned to two categories, one classified as middle class, the other as lower class. The intention of the categorization was to obtain 20 middle class families and 20 lower class families in each pool. The purpose of the substitute pools was to provide a set of alternate families which could be used in the study if families from the first pool did not agree to participate. An equally weighted combination of the occupation of the head of the household and a rating of his (or her) education was used as the basis of the social class classification.

From the standpoint of the statistical analysis, the use of a factorial design makes it possible to isolate the effect of the variable under such consideration, while controlling for the effect of 'unwanted' variables. Such a design has been used in ethnic group studies by Strodbeck (1958), Deutsch *et al.* (1967), Lesser *et al.* (1964), and by Stodolsky and Lesser (1967).

In the case of the Southern Italians and the Canadian Indians it was not possible to form completely parallel middle class pools; in the case of the Jewish families it was not possible to duplicate the lower class group. The final sample within each ethnic group included 37 families, 18 classified as middle class and 19 as lower class. Because 'perfect' matching was not achieved across ethnic groups, the effects of social class were also investigated in the analysis of the data.

Results

Before the relationship between ethnicity and achievement orientation was examined, the reliabilities of the achievement orientation scales were

estimated by calculating coefficient alpha. Since the study was concerned with the differences in mean scores between groups the reliability coefficients, which are presented in Table 2, were considered to be of an acceptable level.

TABLE 2
RELIABILITY COEFFICIENTS OF THE ACHIEVEMENT ORIENTATION SCALES

Scale	Reliability Coefficient	Standard Deviation
P/Activeness	.80	11.29
P/Intellectuality	.88	17.05
P/English	.93	17.83
P/Achievement	.94	35.18

With respect to the relationship between ethnicity and achievement orientation it was hypothesized that the Jewish and white Anglo-Saxon Protestant groups would exert a significantly stronger achievement orientation than the other three ethnic groups.

In Table 3, the mean scores of the achievement orientation factors for each ethnic group have been presented. The scores on each of the factors were converted to standard scores, calculated over the total sample of families, with a mean of 50 and a standard deviation of 10.

TABLE 3
MEAN SCORES OF THE ACHIEVEMENT ORIENTATION FACTORS OF EACH ETHNIC GROUP

Ethnic Group	Achievement orientation factors			
	P/Activeness	P/Intellectuality	P/English	P/Achievement
Jewish	54.8	56.6	55.0	58.2
White Protestant	54.4	53.9	58.9	52.4
Franco-Ontarion	51.4	50.9	44.3	49.8
Southern Italian	44.8	47.5	42.5	48.9
Canadian Indian	44.5	41.0	49.2	40.6

When differences between the ethnic groups in the levels of each of the factors were examined, it was found that in:

1. Press for activeness: Jewish, Protestant, and Franco-Ontarion families exerted a similar press for activeness, but they exerted a significantly stronger press than the Southern Italian and Canadian Indian families.
2. Press for intellectuality: Jewish families had significantly higher press for intellectuality scores than did the Franco-Ontarion, Southern Italian,

- and Canadian Indian families. The Jewish families did not differ significantly from the Protestant families, and the Protestant and Franco-Ontarion families did not differ significantly from each other.
3. Press for English: The Protestant families had a significantly stronger press for English than the Jewish families. These two groups exerted a significantly stronger press than the other three groups. The press for English scores of the Canadian Indians was significantly higher than the scores for the Franco-Ontarions and Southern Italians. These latter two groups did not differ significantly.
4. Press for achievement: Jewish families had a significantly stronger press for achievement than the Protestant families. The Protestant group did not differ significantly from the Southern Italian and the Franco-Ontarion groups. All groups exerted a significantly stronger press than the Indian group.

Overall, the results indicated that the Jewish and Protestant groups provided a stronger achievement orientation than did the Southern Italian and Canadian Indian groups. These results supported the acceptance of the hypothesis. The Franco-Ontarion group scores were, in general, significantly lower than the scores of the Jewish group. However, on three of the scales the differences between the Franco-Ontarions and the white Protestants were not significant. Therefore the hypothesis was not fully

TABLE 4
RELATIONSHIP BETWEEN ETHNICITY, SOCIAL CLASS, AND
ACHIEVEMENT ORIENTATION

Criterion	Predictor Variables	Corrected Multiple ^a Correlation R_c	Amount of Total Variance R_c^2
P/Activeness	Ethnicity	.43***	18.49***
	A = Ethnicity + Social Class	.61***	37.21***
	B = Social class	.48***	23.04***
	A - B = Ethnicity		14.17***
P/Intellectuality	Ethnicity	.50***	25.00***
	A = Ethnicity + Social class	.69***	47.61***
	B = Social class	.53***	28.09***
	A - B = Ethnicity		19.52***
P/English	Ethnicity	.62***	38.44***
	A = Ethnicity + Social class	.68***	46.24***
	B = Social class	.36***	12.96***
	A - B = Ethnicity		33.28***
P/Achievement	Ethnicity	.56***	31.36***
	A = Ethnicity + Social class	.73***	53.29***
	B = Social class	.52***	27.04***
	A - B = Ethnicity		26.25***

*** $p < .001$.
^aCorrected to allow for cumulative errors in R , and for small sample size.

supported. But the results did indicate that, in general, ethnicity was related to achievement orientation in the manner that had been predicted.

The relationship between ethnicity and achievement orientation was examined further by determining the amount of variance in the academic orientation scores which could be attributed to the independent influence of ethnicity, after accounting for the effects of social class and the covariation of social class and ethnicity. The results of the analysis, which have been presented in Table 4, indicated that, although social class was significantly related to each of the achievement orientation factors, the independent contribution of ethnicity to the variation in the orientation scores was also significant.

The results indicated that ethnicity and social class accounted for a large amount of the variance in the achievement orientation scores, which provided support for the theoretical framework.

Ethnicity and Intelligence

The second concern of the study was to examine the interrelationships among the constructs of ethnicity, social class, achievement orientation, and intelligence. An analysis of the mean intelligence test scores, presented in Table 5, indicate: (1) that the mean score of the middle class boys was significantly higher than the mean score of the lower class boys, and (2) that the mean score of the Jewish boys was significantly higher than the mean scores of the other groups. The Protestant group differed significantly from the Franco-Ontarions and Canadian Indians, but not from the Southern Italians. The Southern Italian boys did not differ significantly from the Franco-Ontarions, but they had a significantly higher mean score than the Canadian Indians. The Franco-Ontarions and the Canadian Indians did not differ significantly from each other.

TABLE 5
ETHNICITY, SOCIAL CLASS, AND INTELLIGENCE TEST SCORES

Group	Mean Intelligence Score
Middle class	106.7
Lower class	98.1
Jewish	114.6
White Protestant	105.7
Southern Italian	101.2
Franco-Ontarion	96.3
Canadian Indian	93.4

A multiple regression model was used to examine the interrelationships between ethnicity, social class, achievement orientation, and intelligence. In the model, the ethnic group membership data formed a set of mutually exclusive categories, the social class and achievement orientation data formed a set of continuous predictor variables, and the intelligence scores formed the criterion vector. The results of the analysis which have

been presented in Table 6, indicated that ethnicity accounted for a small but significant percentage of the variance in the intelligence test scores over and above the contribution of social class and achievement orientation scores. Again, the results provided support for the theoretical framework.

TABLE 6
ETHNICITY, SOCIAL CLASS, ACHIEVEMENT ORIENTATION, AND
INTELLIGENCE

Criterion	Predictor Variables	Corrected Multiple Correlation R_c	Amount of Total Variance R_c^2
Intelligence	Ethnicity	.60***	36.00***
	Social class	.45***	20.25***
	A = Ethnicity + Social class + achievement orientation	.76***	57.76***
	B = Social class + achievement orientation	.71***	50.41***
	C = Ethnicity		7.35**

**p < .01
***p < .001

Conclusions

The results of the study indicate that the Jewish and the white Anglo Saxon Protestant groups, which are over-represented in the upper levels of the Canadian occupational hierarchy, are characterized by a combination of above average achievement orientation and intelligence test scores. Below average achievement orientation and intelligence test scores characterized the Canadian Indian group which is largely concentrated in the lower levels of the occupational hierarchy.

In general, the Southern Italian and Franco-Ontario groups, which are over-represented in the lower levels of the occupational hierarchy, exhibited a combination of either average or below average achievement orientation and intelligence test scores. The different intelligence test performance between these two groups may be related to the nature of the home linguistic environment. In the study it was found that the low press for English which was exerted by the Franco-Ontarions was associated with an extremely high press for French. Alternatively, in the Southern Italian homes there was little desire by parents to retain Italian as the language of interaction between themselves and their children. Ausubel (1958) and Olson and MacArthur (1962) have suggested that a bilingual home environment may be a retarding factor in intelligence test performance.

Miller (1971) has recently stated the need for more studies which examine factors that produce occupational mobility rather than those which examine the consequences of mobility. By examining the interac-

tions among the constructs of ethnicity, social class, achievement orientation, and intelligence, the present study is, hopefully, a move in that direction.

References

- Alwin, D. F., & Mueller, C. W. Comment on "Toward a Temporal Sequence of Adolescent Achievement Variables." *American Sociological Review*, 1971, 36, 503-508.
- Ausubel, D. P. *Theory and Problems of Child Development*. New York: Grune and Stratton, 1958.
- Dave, R. H. The Identification and Measurement of Environmental Process Variables that are Related to Educational Achievement (unpublished doctoral dissertation, University of Chicago, 1963).
- Deutsch, M., et al. *The Disadvantaged Child*. New York: Basic Books, 1967.
- Dilling, H. J. Educational Achievement and Social Acceptance of Indian Pupils Integrated in Non-Indian Schools of Southern Ontario (unpublished doctoral dissertation, University of Toronto, 1965).
- Duncan, B., & Duncan, O. D. Minorities and the Process of Stratification. *American Sociological Review*. 1968, 33, 356-364.
- Duncan, O. D. Ability and Achievement. *Eugenics Quarterly*, 1968, 15, 1-11.
- Fortin, G. Socio-Cultural Changes in an Agricultural Parish. In M. Rioux and Y. Martin (eds), *French Canadian Society*. Toronto: McClelland and Stewart, 1964.
- Gans, H. J. *The Urban Villagers*. New York: The Free Press, 1962.
- Gérin, L. The French Canadian Family—Its Strengths and Its Weaknesses. In M. Rioux and Y. Martin (eds). *French Canadian Society*. Toronto: McClelland and Stewart, 1964.
- Glazer, N., & Moynihan, P. *Beyond the Melting Pot*. Cambridge: M.I.T. Press, 1963.
- Herberg, W. *Protestant-Catholic-Jew*. New York: Anchor Books, 1960.
- Husen, T. Ability, Opportunity and Career—A 26 Year Follow-Up. *Educational Research*. 1968, 10, 170-184.
- Lenski, G. *The Religious Factor*. New York: Doubleday, 1961.
- Lesser, G., et al. *Mental Abilities of Children in Different Social and Cultural Groups*. Washington: Govt. Printing Office, 1964.
- Lipset, S. M., & Bendix, R. *Social Mobility in Industrial Society*. Berkeley: University of California Press, 1958.
- Miller, S. M. The Future of Social Mobility Studies. *American Journal of Sociology*, 77, 1971, 62-65.
- Miner, H. *St. Denis: A French Canadian Parish*. Chicago: University Press, 1939.
- Murray, H. A. *Explorations In Personality*. Oxford University Press, 1938.
- Olson, D. R., & MacArthur, R. S. The Effect of Foreign Language Background on Intelligence Test Performance. *Alberta Journal of Educational Research*, 1962, 8, 157-167.
- Plowden, B., et al. *Children and Their Primary Schools*. London, H.M.S.O., 1967.
- Porter, J. *The Vertical Mosaic*. Toronto: University Press, 1965.
- Rehberg, R. A., et al. Toward a Temporal Sequence of Adolescent Achievement Variables. *American Sociological Review*, 1970, 35, 34-48.

- Report of the Royal Commission on Bilingualism and Biculturalism. *Book II: Education*. Ottawa: Queen's Printer, 1968.
- Rosen, B. C. Race, Ethnicity, and the Achievement Syndrome. *American Sociological Review*. 1959, 24. 47-60.
- Sewell, W. H., & Shah, V. Socioeconomic Status, Intelligence and the Attainment of Higher Education. *Sociology of Education*. 1967, 40. 1-23.
- Stodolsky, S., & Lesser, G. Learning Patterns in the Disadvantaged. *Harvard Educational Review*. 1967, 37. 546-592.
- Strodtbeck, F. L. Family Integration, Values, and Achievement. In David McClelland *et al.* (eds). *Talent and Society*. Princeton: Van Nostrand, 1958.
- Vernon, P. E. Educational and Intellectual Development Among Canadian Indians and Eskimos. *Educational Review*. 1966, 18. 79-91 and 186-195.
- Weiss, J. The Identification and Measurement of Home Environmental Factors Related to Achievement Motivation and Self Esteem (unpublished doctoral dissertation, University of Chicago, 1969).
- Wolf, R. The Identification and Measurement of Environmental Process Variables Related to Intelligence (unpublished doctoral dissertation, University of Chicago, 1964).

W. MATHESON

An Independent Validation of Bales' Concept of "Social Psychological Space"

7,202 responses to Bales' Interpersonal Ratings Questionnaire were analyzed in an attempt to validate the concepts of three-dimensional space as descriptive of individual performance in small groups. In general, the responses of student-teachers rating themselves and others on the basis of overt interaction in small learning groups support Bales' concepts of social psychological directions and group space. (Dr. Wayne Matheson is a Post Doctoral Fellow in the Department of Educational Psychology, The University of Alberta.)

R. F. Bales (1950, 1970) describes the dynamics of the small group in terms of Euclidean or three-dimensional space. The group is represented by co-ordinates on three axes: "power", "affection", and "task". These axes are orthogonal. The power axis is considered to be a continuum with one pole in the upward area (considerable power), the other pole downward (submissive and powerless). In similar fashion, the affective and task axes are visualized as continua with poles of positive (promoting good feelings), negative (promoting bad feelings), and forward (pro-task) and backward (anti-task), respectively. The average character of the group process over some period may then be represented as a point location within this three-dimensional space; changes in character of the group may be represented by changes in the location of the point.

This system can also be used to portray the location of any particular individual in the group, or changes in his position over time. Individual performance is represented as a group member's position or "movement" within this defined three-dimensional group space. In this regard, Bales (1970) has delineated a number of personality "types", each of which takes up a particular location on each of these three group space dimensions. He recognized twenty-seven specific areas in the three-dimensional space, each with its characteristic value orientation, personality peculiar-

ities and mode of interaction in the group. Thus a particular "type" of behaviour pattern corresponds to each of these twenty-seven locations.

The individual or group position, and "movement", in this psychological "space" is usually established by interaction process analysis (IPA). Bales' 12 category system is used to "fix" the position of the group at any particular phase of its activity. The most exciting contribution within Bales' recent development of IPA (1970) is to establish a *link* between the analysis of the on-going activity of individuals in groups and these individuals' corresponding questionnaire responses—e.g. Cattell's 16 PF test, M.M.P.I., Thurstone, etc., etc. In addition, he provides a short twenty-six item "Interpersonal Ratings Questionnaire" to help identify the "type" of individual in the group. (The central position in space, a kind of "neutral point" does not have a corresponding item on the questionnaire.) The questionnaire has alternative forms A, B, C. The most frequently used version is Form A, which is shown here with the appropriate key.*

Bales' contention is that his *Interpersonal Ratings Questionnaire* may be used to define the three distinct dimensions of group performance, and that each item on the questionnaire encompasses one of the twenty-six co-ordinates in such a three dimensional space with sufficient accuracy to be useful for prognostic purposes. It would be expected, therefore, that analysis of the questionnaire would turn up three main factors: upward, positive, forward. The analysis should also show that each item on the questionnaire is "loaded" heavily on one, two or all three of these factors depending upon its co-ordinate location on one, two, or all three of the group space dimensions.

Each member of four small training groups (N=48) was asked to rate self, trainer, and each other member in their group, using Form A (see Appendix 1). The questionnaire was administered in this way on six different occasions in the life of each group, after the second, fourth, seventh, tenth, thirteenth, and fifteenth meetings. The total numbers of acceptable responses on these occasions were 1186, 1194, 1219, 1200, 1207, 1196. There was an overall total response of 7202. I.B.M. answer sheets were used so that the questionnaires could be machine scored.

After each administration, a factor analysis was carried out. In addition the grand total of 7,202 responses was analyzed, using the same program. The unrotated factors for this total response are presented as Table 1. It is typical of all the analyses, results of all seven factor analyses being very similar, indicating *four* factors consistently across all seven analyses.

The first factor on every occasion can be identified with the up-down (power) dimension. Almost every questionnaire item which is keyed as upward by Bales has a high positive loading on this first factor, whilst all but three of the nine items keyed downward have a negative loading on this factor. It appears that the items measure more satisfactorily at the upper end of the dimension than at the downward end. The second factor corresponds to the positive-negative (affective) dimension of group space

* This study is part of a larger research project concerned with the validity and reliability of various systems used in analyzing group process and outcomes. The study is supported by a grant from Canada Council. Dr. McLeish, who directs this project, and the author of this article, are especially grateful to Dr. R. F. Bales for use of a number of his unpublished manuscripts, for assistance in various training problems, and for his valuable comments on the first draft of this paper.

(signs being reversed). The questionnaire items are again in almost complete agreement with Bales' predictions. He comments:

The third factor, as it turns out seems to measure location on the downward end more satisfactorily than on the upward end. Factors one and three are orthogonal in the study, although they both seem to have to do with the power dimension. Examination of the items indicates that the highest items on factor one seem to deal with the interaction and involvement of the individual in the group in terms of verbal interaction, whereas the highest items on factor three seem to deal with values, or beliefs, that might be expected to motivate a self-conception consistent with low participation. Factor one seems to deal with interactive behaviour, factor three with values and beliefs about low status. This difference in the items was not intended by me, but is an accident of the assignment of different items to the different forms A, B, and C. Items of variegated kinds, some on participation or verbal interaction, some on values, some on liking or other feelings aroused, some on non-verbal behaviour, are used in the various forms, and apparently varied unsystematically. Nevertheless, the split of the conceptualized factor, Upward-Downward, into two orthogonal components, as found in responses to Form A, is of considerable interest to future work with the factors and the space.*

The fourth factor corresponds to the forward-backward (task) dimension of group space (signs being reversed). Again the questionnaire items are in very substantial agreement.

A further examination of the first factor indicates that it contains high loadings for items which are not keyed in the expected directions of U or D (items 10, 11, 17, for example). These three items are all expected to have a high positive component (loading on factor two), and do, with the exception of item 11. Items 18 and 19, also expected to measure in the positive direction, have a strong loading on factor one. It may be said then, that the items which were expected to load primarily in the positive direction, also had strong loadings in the upward direction. This suggests that, in these groups, being dominant and being positive tend to go together. The second factor would then be correlated with the first, tending towards an axis that might be defined as a "good leadership" factor.

The eigenvalues show that the greater part of the variance of the questionnaire is accounted for by the first factor. Form A, whilst discriminating across the items, and demonstrating that the three dimensions of group space are manifest, gives precedence to dominant (upward) behaviour as the most influential force determining the direction of responses to an individual in the group.

The overall analysis shows remarkable conformity with Bales' expectations. Many items are *exactly as predicted*. Others are only slightly discrepant. There are very few items indeed the loadings of which are not of the expected magnitude: there are even fewer items the loadings of which are opposite to the expected direction. It might be best to illustrate the discrepant items.

Item 12 has been keyed as F. In this population it does measure in that direction, and is one of the two highest items, but it also has a considerable downward component.

* Bales, personal correspondence, April, 1972.

Item 13 is keyed NF, and it is the best item for measuring the Forward component, but it has an unexpected positive component.

Items 18, 19 are keyed DP, DPF, but always have U loadings. In addition, item 19 does not receive any loading on F, as expected.

Item 20 is keyed DF, but never receives F loadings.

Item 21 is keyed DNF, but initially has a U loading.

Item 23, keyed DNB, hardly shows either an N or a B component in this population.

Item 25, keyed DPB, does not show any positive component, and if anything, has a forward instead of a backward direction.

Before attempting any explanation concerning the failure of these eight items in certain aspects, it should be kept in mind that there were eighteen items which met factorial expectations. As regards, these eight items a considered judgment would be that they did not "fully succeed". It also seems meaningful to re-emphasize the consistency of factor pattern across all seven major factor analyses.

The eight items which did not fully succeed were examined to account for their inability to meet expectations. Five cases where reasonable explanations could be given are presented below. Items 19, 21 and 25 were found difficult to explain, and are left to the reader's judgment.

Item 12—*Conservatism* is readily associated with passivity, or a laissez-faire attitude. It is more likely to be tainted with submissiveness (D), rather than neutrality in terms of any encounter with power (U).

Item 13—*Objectively* is a term which seems easily related to honesty. Honesty has a positive (P) rather than negative connotation.

Item 18—The phrase "*To make others feel*" smacks of manipulation and control. In this way the item may have acquired an association with power (U) more easily than with expected submissiveness (D).

Item 20—*Introverted* is a submissive, non-resistive state which seems to account for the downward loading, while *introspective* reflects a more anti-authoritarian individual who might not easily be "seduced" into attempting the group trainer's task. In this way the F component may have become less prominent.

Item 23—*Failure and withdrawal* do not seem to be terms which we would associate easily with drawing negative feelings from others (N), or deviancy (B) and so seems confined to downward (D) associations.

TABLE 1
UNROTATED FACTOR MATRIX OF INTERPERSONAL RATINGS
QUESTIONNAIRE USING TOTAL RESPONSES N = 7202

Item No.	Bales keys as	Factor 1	Factor 2	Factor 3	Factor 4
1	U	0.882	0.202	0.017	0.030
2	UP	0.883	-0.145	-0.035	0.048
3	UPF	0.784	-0.224	-0.044	-0.205
4	UF	0.849	0.198	-0.002	-0.210
5	UNF	0.402	0.733	-0.027	-0.387
6	UN	0.514	0.766	-0.019	-0.177
7	UNB	0.332	0.648	0.195	0.353
8	UB	0.401	0.630	0.157	0.412
9	UPB	0.590	-0.569	0.143	0.288
10	P	0.709	-0.367	0.279	0.029
11	PF	0.781	0.020	0.185	-0.222
12	F	-0.312	-0.114	0.433	-0.449
13	NF	0.147	-0.228	0.091	-0.669
14	N	0.279	0.243	0.150	-0.090
15	NB	0.428	0.436	0.262	0.145
16	B	0.284	0.465	0.428	0.045
17	PB	0.613	-0.576	0.147	0.239
18	DP	0.422	-0.466	0.484	0.200
19	DPF	0.476	-0.559	0.355	-0.089
20	DF	-0.808	-0.189	0.303	-0.025
21	DNF	0.258	-0.112	0.564	-0.062
22	DN	-0.240	0.652	0.303	0.020
23	DNB	-0.587	0.070	0.498	0.120
24	DB	-0.689	0.150	0.367	-0.067
25	DPB	-0.137	0.028	0.802	-0.171
26	D	-0.442	0.019	0.614	0.140
EIGENVALUE =		8.103	4.444	2.954	1.556

APPENDIX 1

INTERPERSONAL RATINGS QUESTIONNAIRE FORM A

	If	Key
1. Does he (or she) seem to <i>receive a lot of interaction</i> from others?	Yes	U
2. Does he seem <i>personally involved in the group</i> ?	Yes	UP
3. Does he seem <i>valuable for a logical task</i> ?	Yes	UPF
4. Does he <i>assume responsibility for task leadership</i> ?	Yes	UF
5. Does he <i>speak like an autocratic authority</i> ?	Yes	UNF
6. Does he seem <i>dominating</i> ?	Yes	UN
7. Does he seem to demand <i>pleasure and gratification</i> ?	Yes	UNB
8. Does he seem to <i>think of himself as entertaining</i> ?	Yes	UB
9. Does he seem <i>warm and personal</i> ?	Yes	UPB
10. Does he <i>arouse your admiration</i> ?	Yes	P
11. Does he seem especially to be <i>addressed when others have serious opinions</i> about which they want confirmation?	Yes	PF
12. Does he seem to stand for the most <i>conservative ideas and beliefs of the group</i> ?	Yes	F
13. Does he always seem to try to <i>speak objectively</i> ?	Yes	NF
14. Does he seem to feel that his <i>individual independence</i> is very important?	Yes	N
15. Does he seem to <i>feel that others are generally too conforming to conventional social expectations</i> ?	Yes	NB
16. Does he seem to <i>reject religious belief generally</i> ?	Yes	B
17. Do you feel <i>liking</i> for him or her?	Yes	PB
18. Does he seem to <i>make others feel he admires them</i> ?	Yes	Dp
19. Does he seem to believe that <i>equality and humanitarian concern</i> for others is important?	Yes	DPF
20. Does he seem very <i>introverted, serious shy, introspective</i> ?	Yes	DF
21. Does he seem to believe that it is necessary to <i>sacrifice the self</i> for higher values?	Yes	DNF
22. Does he seem <i>resentful</i> ?	Yes	DN
23. Does he seem to accept <i>failure and withdrawal</i> for himself?	Yes	DNB
24. Does he seem to <i>withhold cooperation</i> passively?	Yes	DB
25. Does he seem to <i>identify with some group of underprivileged persons</i> ?	Yes	DPB
26. Does he tend to <i>devalue</i> himself?	Yes	D

References

Bales, R. F., *Interaction Process Analysis: A Method for the Study of Small Groups*, Cambridge, Mass.: Addison-Wesley, 1950.

Bales, R. F., *Personality and Interpersonal Behavior*, New York: Holt, Rinehart and Winston. 1970.

Couch, A. S., *Psychological Determinants of Interpersonal Behavior*. Unpublished Doctoral Dissertation, Harvard University, Cambridge, Mass., 1960.

Matheson, W, E., *The Structure of Learning Groups*. Unpublished Doctoral Dissertation, The University of Alberta, 1971.

R. G. STENNETT, P. C. SMYTHE

and

MADELINE HARDY

Language Background, Guessing, Mastery and Type of Error in Beginning Reading¹

This paper presents the results from a study of reading skill development of 81 first, and 45 second grade children. Hypothetical links in the causal sequence relating socioeconomic status to reading achievement were tested using guessing ratios as an operational measure of reflection-impulsivity, the key cognitive mediating variable. Significant relationships were shown to exist between socioeconomic status and cognitive style, cognitive style and reading achievement and cognitive style and type of reading error made. However, statistical tests of the relationship between socioeconomic status and reading achievement failed to reach significance. Failure to confirm this hypothesized relationship is explained in terms of inadequacy of the measurements and non-representativeness of the student sample. Implications of the findings are briefly noted. (Dr. Stennett, Chief of Educational Research Services, and Dr. Smythe, Research Associate, are members of the London Board of Education; Dr. Hardy is an Associate Professor at Althouse College of Education, London, Ontario.)

Although the relationship between socioeconomic status and the development of skill in reading has been repeatedly documented, the processes which mediate this relationship have only recently begun to become apparent. Shipman and Hess (1966, p.17) summarize current thinking as follows:

“... the structure of the family shape[s] communication and language and ... language shapes thought and cognitive styles of problem solving. ... A problem-solving approach requires reflection and the ability to weigh decisions, to choose among alternatives. The effect of restricted speech

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and of status orientation [lower socioeconomic groups] is to foreclose the need for reflective weighing of alternatives and consequences: the use of an elaborated code with its orientation to persons and consequences [upper socioeconomic groups] tends to produce a cognitive style more easily adapted to problem-solving and reflection."

A key mediator of the relationship between socioeconomic status or language background and the development of skill in reading appears, therefore, to be variations in cognitive style along a dimension of reflection-impulsivity. Kagan (1965, p.609) has documented ". . . the intra-individual stability and inter-task generality . . ." of such a dimension which he defines as

". . . the tendency to reflect over alternative-solution possibilities, in contrast to the tendency to make an impulsive selection of a solution, in problems with high response uncertainty."

Miller and Mumbauer's (1967) report of a positive relationship between Kagan's measure of reflection-impulsivity and socioeconomic status provides empirical support for the relevance of this particular dimension of cognitive style as a significant mediator of the socioeconomic status—reading skill relationship.

Detailed analyses of the oral reading behavior of first grade children by Biemiller (1970) and Weber (1970) have shown significant increases in the number of graphically-constrained errors during the first grade. This type of error tends to displace the earlier, contextually-constrained one in which the child's response bears little relationship to the graphic structure of the stimulus word. Thus it appears that, during the grade one year, children improve their oral reading performance by increasing the degree of attention they give to the stimulus word and moderating their tendency to guess, i.e., they become more reflective. It follows, therefore, both that reflective children should make fewer word recognition errors and also that a greater proportion of their errors should be of the graphically-constrained type. Although Kagan (1965) reported that reflective children do make fewer word recognition errors, his method of presenting the types of errors his subjects made does not allow conclusions with respect to the proportion of their errors that were graphically constrained.

Goodman's (1970) perceptive description of reading as a 'psycho-linguistic guessing game' reflects the major, and perhaps very different, influence of cognitive style in both learning to read and in skilled reading. While it is apparent that a more reflective style, which involves careful attention to the graphic structure of words, may facilitate learning to read, a more 'impulsive' strategy, involving greater use of guessing from context cues, may be indispensable to efficient, skilled reading. It is also quite possible that the differential growth in reading skill between children from different socioeconomic backgrounds may result from the interaction of cognitive style and instructional method. Methods which emphasize early acquisition of sight vocabulary by the whole-word, look-say approach tend to reinforce the cognitive style of lower socioeconomic status children and may make it more difficult for them to shift to the detailed, reflective examination of words which is apparently (Beimiller, 1970) associated with increased mastery.

The 'causal' sequence relating socioeconomic status to reading achievement, apparent in the results of the research reported above, can be summarized as follows: socioeconomic status differences are associated with different family structures; family structures shape communication and language patterns; language shapes cognitive styles along a dimension of reflection-impulsivity; a reflective cognitive style, characteristic of higher socioeconomic groups, leads beginning readers to pay increasingly detailed attention to the graphic characteristics of words; such attention is characteristic of those grade one children who show the greatest reading achievement. The present paper presents data bearing on the adequacy of the hypothesized links in this causal sequence.

Method

Subjects

The Ss for this study were 81 grade one and 45 grade two students enrolled in an inner-city school in London, Ontario. The mean chronological age in months, as of September, 1970, was 76.5 for the grade one and 90.8 for the grade two students. There was a larger percentage of boys in both grade one (53) and grade two (58). The socioeconomic status distribution of the sample was markedly skewed toward the 'low' end, less than five per cent of students coming from families headed by persons employed as professionals or managers. Only four students had attended nursery school and none had had day care. About 42 per cent of the grade one and 32 per cent of the grade two students had attended at least one other elementary school than the one in which they were enrolled. Fourteen per cent of the grade one and 18 per cent of the grade two students had repeated the prior grade.

Measurements

All children in this study were given a large battery of tests designed to measure the various elemental subskills considered necessary for success in beginning reading (Stennett et al., 1970a). The tests were administered during May and June 1971 by a specially-trained group of examiners under the supervision of two psychologists.

Those tests from the larger battery that are reported in this study are as follows:

1. *Allographs*. This test contained 182 items, each consisting of three letters surrounded by a rectangular frame. The letters could appear in either upper- or lower-case format and in primary, century or cursive script style. For each item the student was asked whether or not the frame contained a particular letter and, if so, to put a mark on the letter named. One-seventh of the frames did not contain the letter named by the examiner. This test is essentially an elaborate measure of letter recognition skill. Separate scores were derived for students' performance on upper- and lower-case letters.

2. *Word recognition and decoding*. This test was composed of 225 letter-strings, a third each of lengths 2, 3 and 4. One fifth of the letter-strings of each length were real words which occur with high frequency in children's readers (Stennett et al., 1970b). The student was shown each

letter-string using a carousel projector and asked whether or not it was a real word. If he did not respond within three seconds he was shown the next item. Rest periods were given after each 75 items.

After the student had responded to all 225 items he was shown each item he had indicated was a real word and was asked to tell the examiner what the word was. His responses were recorded verbatim.

3. *Visual segmentation.* The 60 items in this test consisted of 30, 5-letter strings and 30, 7-letter strings. Each of the 5-letter strings contained two adjacent letters which composed commonly occurring digraphs in the English language. The arrangement of the remaining letters in the string was such that all other possible pairs of letters occur with very low frequency in the language (Underwood & Schulz, 1960). The 'target' digraphs were located with equal frequency in the initial, middle and final positions. The 7-letter strings were composed in a similar fashion using trigraphs.

The student was shown each item by carousel projector and asked to indicate the two (or three) letters 'that are sometimes part of real words'. If the student gave no response within 8-10 seconds, the next item was administered.

4. *Visual template.* Each of the 130 items on this test consisted of a lower-case letter, in primary print, from which certain portions had been removed. Each of the 26 letters was presented five times, with decreasing amounts of the letter removed. Prior experimentation ensured that, for each letter, the five versions represented increasingly difficult recognition problems.

The items, printed on a strip of paper, were presented one at a time through an aperture in a small box. The student was asked to give the name of each letter if he could. If he knew which letter it was but didn't know its name, he was allowed to point it out on a chart. If the student did not respond in 4-5 seconds he was shown the next item. The items, arranged in decreasing order of difficulty, were presented in two blocks of 65 with a different type of test administered between the blocks.

A student's visual template strength score for a letter was obtained by summing his performance on the five items for that letter, each item being weighted according to its difficulty.

5. *Phoneme-grapheme recognition.* For each item on this test the student was shown a set of five letters by carousel projector and then heard a phoneme played by tape recorder. He was asked to 'point to the letter that makes that sound'. If he did not respond within eight seconds he was given the next item.

The student's knowledge of 33 different phoneme-grapheme associations was tested in this manner by giving three trials of 33 items each. The position of the correct response was randomly assigned within items and across trials.

6. *Letter naming.* Students were shown each letter of the alphabet, in lower-case, primary-print form, by carousel projector and asked to give the letter's name as quickly as they could. The latency of a student's response was measured using a voice-activated relay and digital stop clock. One channel of a stereo tape recorder was used both to activate the carousel projector and start the clock; the student's response stopped

the clock. If the student didn't respond within five seconds, the next item was administered. The 26 letters were presented, in the same random order, three times. The student's score for each letter was calculated using a complex formula which took into consideration both the latency and correctness of his responses.

7. *Auditory blending.* This test consisted of two parts. The first part (15 items) involved having the student blend syllables into words; the second part (31 items) required the student to blend phonemes to words. In both parts the number of units to be blended varied from two to four, with approximately one-quarter second pause between units. All items were presented to the student by tape recorder.

In all of the above tests appropriate practice items were provided to ensure that the student understood what was required of him. Standardized procedures were followed by all examiners who used specially prepared test manuals.

In addition to the formal tests four other measures were employed in this study:

(1) *Teacher ratings of oral reading achievement.* The teachers of the children involved in this study were taken from their classrooms near the end of the school year for a day during which each was asked to assign a grade equivalent score for each of her students on oral reading achievement. For example, if a grade one teacher felt that a particular student's oral reading skill in June was typical of that usually developed by grade one students by December, she assigned that student a grade equivalent score of 1-4, i.e., first grade, fourth month. The ratings, therefore, represented the teacher's assessment of the child's level of achievement in absolute terms.

(2) *Socioeconomic status.* This measure was derived for each student by simply finding in which category of the census classification system the occupation of the breadwinner in his family fell. The scale values, therefore, could range from one for professional and technical occupations to eleven for labourers.

(3) *Reading error types.* The errors students made in decoding words on the recognition and decoding test were classified, for purposes of this study, into three different types—two of which will be reported. The first type, consisting of those errors in which there was a fairly obvious correspondence between the stimulus word and the student's response, were called graphically-constrained. They included: reversal or misidentification of a single letter; reversal of letter order; 'phonic' decoding of a nonsense word to a nonsense word (e.g., student decodes <bu> as /b^/). The second type of error consisted of those in which there was no apparent relationship between the stimulus word and the student's response (e.g., student decodes <yne> as /r^n/). These errors were called non-graphically constrained. (The third type of error, not considered in this report, involved adding or deleting letters and reversals of letter order coupled with misidentification of a letter.) In order to make appropriate statistical comparisons, the percentages of each type of error were calculated for each student. The data for reading error variables, therefore, express the degree to which a student's errors were of a certain type, rather than the number of errors he made.

(4) *Guessing ratios.* For each of the first five tests listed above five guessing ratios (GR) were calculated for each student using the formula:

GR = 102 - { (Number of correct responses / Number of responses made) x 100 } + 1 }

Thus, a student who made ten responses, all of which were correct, would have a GR = 1. A student who made ten responses but had none correct would have a GR = 101. Since time limits for responding were required in all tests and since longer latency of response is characteristic of reflective children (Kagan, 1965), it was assumed that reflective children would make fewer responses and have, therefore, lower guessing ratios. Given the circumstances of testing, guessing ratios were considered to be measures of reflection-impulsivity.

Data Analysis

The data for all 126 Ss were punched onto cards and all statistical analyses done by computer. Intercorrelation matrices were calculated for the five guessing ratios and the ten reading subtest or achievement measures. Students were grouped, in turn, by: (i) their success in decoding words, (ii) their guessing ratio calculated from the word recognition test, and (iii) their socioeconomic status. One-way analyses of variance were performed for several dependent measures for each of these three classification variables.

Results

Table 1 presents the intercorrelations of the guessing ratios derived from five sub-skill tests as well as the correlation of each guessing ratio with the percentage of non-graphically-constrained decoding errors. A factor analysis of the guessing ratio intercorrelations produced one factor with loadings ranging from .59 to .80. These data tend to support Kagan's (1965) contention that reflection-impulsivity can be regarded as a dimension which shows 'intra-individual stability and inter-task gen-

TABLE 1
INTERCORRELATIONS OF GUESSING RATIOS DERIVED FROM FIVE
READING SUB-SKILL TESTS AND CORRELATIONS BETWEEN GUESSING
RATIOS AND PERCENT OF NON-GRAPHICALLY-CONSTRAINED
DECODING ERRORS

Test for which guessing ratios were derived	2	3	4	5	6
1. Allographs	52	30	33	74	58
2. Word recognition		52	47	53	66
3. Visual segmentation			52	33	46
4. Visual template				44	46
5. Phoneme-grapheme recognition					62
6. Percent of non-graphically-constrained decoding errors					

erality'. It is also apparent that guessing ratios derived from a variety of types of reading skill tests can predict the kinds of decoding errors students will tend to make. The positive correlations between guessing ratios and non-graphically-constrained errors indicate that reflective children make proportionally fewer such errors.

The intercorrelation of teachers' ratings of oral reading achievement and students' scores on the various reading sub-skill tests are presented in Table 2. The fact that all of the sub-tests correlate moderately with both teacher ratings of achievement and with one another suggests that the tests do measure both relevant and different types of skill involved in learning to read. Since the number of words correctly decoded correlated quite well (.78) with teacher ratings of achievement, this test was selected as an operational measure of reading mastery.

TABLE 2
INTERCORRELATIONS OF READING SUB-SKILL TEST SCORES
AND TEACHERS' RATINGS OF ORAL READING ACHIEVEMENT

Reading test or rating	2	3	4	5	6	7	8	9	10
1. Teacher ratings	51	47	78	60	51	65	63	61	62
2. Allographs—lower-case		91	63	33	36	81	86	53	49
3. Allographs—upper-case			55	29	28	71	81	42	40
4. Decoding words				58	51	75	80	65	60
5. Visual segmentation					42	40	42	42	42
6. Visual template						40	44	43	29
7. Phoneme-grapheme recognition							83	64	62
8. Letter naming								64	52
9. Auditory blending-syllables									67
10. Auditory blending-phonemes									

With df = 125 an r of .174 is required for $p < .05$; .228 for $p < .01$.

Mean guessing ratios, derived from four reading sub-skill tests, for students grouped by the number of words they decoded correctly are presented in Table 3. All four of the one-way analyses of variance yielded F ratios significant well beyond the .001 level of confidence. These data indicate that the development of mastery in reading at the primary level is clearly associated with the use of a reflective cognitive style.

The mean percents of graphically- and non-graphically-constrained errors for students grouped by guessing ratios derived from the word recognition test are presented in Table 4. The data of this table show that reflective children (low guessing ratios) tend to make a relatively higher percentage of graphically-constrained decoding errors and a correspondingly small percentage of non-graphically constrained errors.

TABLE 3

MEAN GUESSING RATIOS FROM FOUR SUB-SKILL TESTS FOR STUDENTS GROUPED BY NUMBER OF WORDS CORRECTLY DECODED ON THE WORD RECOGNITION TEST

Test used to derive guessing ratio	Number of words correctly decoded				F ratio*
	0-13	14-26	27-39	40-45	
Visual segmentation	69.25	62.31	48.42	29.73	20.33
Visual template	71.86	69.23	60.03	53.63	14.74
Word recognition	73.86	51.69	35.10	25.94	53.63
Phoneme-grapheme	37.39	12.77	7.19	4.27	42.15
Number of cases	28	13	36	49	

* For df = 3,120 an F ratio of 5.79 is required for significance at $p < .001$.

TABLE 4

MEAN PER CENT OF GRAPHICALLY-CONSTRAINED AND NON-GRAPHICALLY-CONSTRAINED ERRORS FOR STUDENTS GROUPED BY GUESSING RATIOS DERIVED FROM THE WORD RECOGNITION TEST

Type of Error	Guessing ratio groups				F ratio*
	1-25	26-50	51-75	76-101	
Graphically-constrained	73.44	72.14	49.68	43.0	9.23
Non-graphically-constrained	6.42	11.06	31.74	54.5	38.85
Number of cases	14	31	36	45	

*For df = 3,120 an F ratio of 5.79 is required for significance at $p < .001$.

Mean guessing ratios, derived from the word recognition test, and mean number of words correctly decoded are presented in Table 5 for students grouped by socioeconomic status.

These data suggest that children from lower socioeconomic groups are less reflective and develop less mastery in reading than do children from higher socioeconomic groups. The fact that these relationships do not reach more substantial levels of statistical significance may be related to the crudeness of the measure of socioeconomic status used and to the fact that the distribution of the sample in terms of this variable was

TABLE 5
MEAN GUESSING RATIOS DERIVED FROM THE WORD RECOGNITION
TEST AND MEAN NUMBER OF WORDS CORRECTLY DECODED FOR
STUDENTS GROUPED BY SOCIOECONOMIC STATUS

Variable	Socioeconomic status groups			F ratio*	P
	High	Middle	Low		
Guessing ratio	39.96	36.04	49.60	4.01	<.05
Number of words decoded	30.0	33.33	26.04	2.92	N.S.
Number of cases	25	54	47		

* For df = 2,125 an F of 3.07 is required for p <.05.

highly skewed. Whereas a representative sample would have contained approximately 24 per cent of students from professional and managerial family backgrounds, our sample contained less than 5 per cent.

Discussion

The results of this study reinforce Kagan's postulation of reflection-impulsivity as a dimension of cognitive style which influences performance on a wide variety of reading-like tasks. Guessing ratios appear to be satisfactory measures of this dimension. While some of the variability in guessing ratios is obviously task-specific, a precise allocation of variance is difficult because, as Kagan (1965, p.626) has noted, the effects of a reflective strategy are maximal at intermediate degrees of mastery.

Several of the hypothesized links in the postulated causal sequence relating socioeconomic status to reading achievement were supported by our findings. Cognitive style is significantly related both to the degree of reading skill developed by beginning readers and the kinds of errors they make. Cognitive style is also related to socioeconomic status and the trend of the findings suggests a significant relationship between socioeconomic status and reading achievement. Studies currently in process, which involve more precise measures of socioeconomic status and a more representative sample of students, will yield further evidence on these points.

Educational Implications

This general line of research has several important implications for reading instruction. First, it calls into question those methods of beginning reading instruction which encourage guessing or, alternatively, which do not encourage detailed examination of words as a word attack strategy. Second, it raises the possibility, imaginatively illustrated in Meichenbaum's work (1971a & b), of enhancing lower socioeconomic status children's skill development in reading by teaching them to adopt a reflective

cognitive style. Finally, it suggests the need for studies directed at discovering the effects of the interaction between instructional methods and cognitive style.

References

- Biemiller, A. The development of the use of graphic and contextual information as children learn to read. *Reading Research Quarterly*, 1970, 6, 75-96.
- Goodman, K. S. Reading: A psycholinguistic guessing game. In Singer, H. & Ruddell, R. B. (Eds.) *Theoretical Models and Processes of Reading*. Newark, Delaware. I. R. A., 1970.
- Kagan, J. Reflection-impulsivity and reading ability in primary grade children. *Child Development*, 1965, 36, 609-628.
- Meichenbaum, D. H. Implications of research on disadvantaged children and cognitive training programs for educational television: Ways of improving Sesame Street. Paper presented at A.P.A., Washington, D.C., 1971.
- Meichenbaum, D. H. & Goodman, J. Training impulsive children to talk to themselves: A means of developing self-control. *Journal of Abnormal Psychology*, 1971, 77, 115-126.
- Miller, J. & Mumbauer, C. Intellectual functioning, learning performance and cognitive style in advantaged and disadvantaged preschool children. Unpublished manuscript. George Peabody College for Teachers, 1967.
- Shipman, V. C. & Hess, R. D. Early experience in the socialization of cognitive modes in children: a study of urban negro families. Paper presented at the 5th Annual Conference on the Family and Society at the Merrill-Palmer Institute, 1966.
- Stennett, R. G., Smythe, P. C., Hardy, Madeline, Wilson, H. R. & Thurlow, Merle. Developmental patterns in elemental reading skills: Preliminary report. Board of Education, London, Canada, 1970a (mimeo).
- Stennett, R. G., Smythe, P. C., Hardy, Madeline & Wilson, H. R. A method for analyzing the grapheme-phoneme structure of primary reading text: Preliminary findings. *Journal of Reading Behavior*, 1970b, 4, 265-280.
- Underwood, B. J. & Schulz, R. W. *Meaningfulness and verbal learning*. Chicago: Lippincott, 1960.
- Weber, Rose-Marie. A linguistic analysis of first-grade reading errors. *Reading Research Quarterly*, 1970, 5, 427-451.

P. W. KOZIEY

and

J. H. BRAUER

Using Mental Practice to Improve Reading Performance

In the experiment reported here, reading rate and vocabulary performance increased as a result of mental and physical practice of three selected reading drills. The increase, as measured by the Nelson Denny Reading Test after four one-half-hour drill sessions, was significant at $\alpha.05$ for Vocabulary and $\alpha.01$ for Reading Rate. This leads us to conclude that mental practice can be used effectively to improve reading performance. (Dr. Koziey is an Associate Professor in the Department of Educational Psychology at The University of Alberta, and J. H. Brauer is a Counsellor with the Edmonton Public School System, Edmonton, Alberta.)

In 1943 Vandell, Davis and Clugston found no significant differences in accuracy of basketball shooting and dart throwing by a group which had actual physical practice in these skills and a group which had mental practice only, although both groups scored significantly better than the no-practice group. Subsequently, interest in mental practice has concerned its possible facilitating effect in the initial acquisition of a perceptual-motor skill, in its retention, or in improving the performance of a skill.

A number of studies since 1943 have demonstrated that the actual performance of certain tasks can be improved through mental practice (D. M. Beattie, in Arnold, 1946; Twining, 1949; Clark, 1960; Start, 1960), such as retention of maze habits (Sackett, 1935) and digit substitution and card sorting (Perry, 1939). The present study investigates the effects of mental practice in learning basic rapid reading skills. Since reading is a complex visual-motor task with physical, physiological, and emotional components, it was predicted that mental practice of certain reading skills would improve the over-all reading performance.

Method

There were five groups.

Mental practice refers to the symbolic rehearsal of a physical activity in the absence of any gross muscular movement (Richardson, 1966, p. 148). *S* sits or stands, with eyes closed, and, in imagination, rehearses the

specified skills. *Physical practice* refers to actual specific practice of the skills to be acquired. *Mental practice plus physical practice* refers to a sequence of practicing which includes both mental and physical activity. *Hand as pacer* refers to the controlling of eye movement by moving the hand across the page just beneath the lines to be read. *No practice* was simply not practicing the skills in any way, nor thinking about them, during a designated period. It should be noted that the term "mental practice" is the same concept referred to by Sackett (1935) as symbolic rehearsal, by Perry (1939) as imaginary practice, by Morrisett (ap. Richardson, 1966) as implicit practice, by Whiteley (ap. Richardson, 1966) as mental rehearsal, by Egstrom (1964) as conceptualizing practice, and by Corbin (1967) as covert rehearsal.

Subjects

S were 85 grade eight boys and girls attending a junior high school in Edmonton, Canada. Ss were chosen to form five groups by selecting names from a hat. Each group originally consisted of 17 members. The five groups were randomly assigned to the tasks defined above. Nine subjects did not complete the post-test, their data were omitted from the analysis. This left 76 Ss distributed among the five groups as follows: mental practice (14), physical practice (15), both mental and physical practice (14), hand as pacer (16), and no practice (17).

Instruments

The Nelson-Denny Reading Test, Revised Edition (NDRT), measured reading ability in terms of vocabulary, comprehension, and reading rate. Two comparable forms of the test were used: Form A for the pre-test and Form B for the post-test. The reliability coefficient as reported by David B. Orr (Buros, 1965) for reading rate and vocabulary was .92, for comprehension it was .81. For vocabulary, the validity test item mean was 47.5 on Form A and 47.7 on Form B. For comprehension items the validity mean for Form A was 44.6 and for Form B was 45.3. The norms were based on scores of more than 21,000 school students from Grades 9 to 16. Although Ss in this study were Grade eight students, the study was not conducted until early spring when Ss were well into the second half of the school year.

Procedure

The groups participated in six sessions, each 45 minutes long, twice weekly for a three week period. Form A of the NDRT was administered to all groups in the first session as a pre-test in order to afford a second check on random sampling, and Form B of the NDRT was given to all groups in the final session as the post-test to determine group differences. The same instructor worked with all groups.

The no-practice group was given the pre- and post-test on the first and last days respectively of the period. In the intervening period the members of this group participated in their regular school work while the others were involved in the experimental sessions; they received no instruction or practice in speed reading skills.

The hand as pacer group was set up to check the use of the hand.

These Ss were also tested in the first and last sessions. During the experimental periods they were given only the instruction to read for five minutes each session, using the hand as a guide by moving it along the page under the line being read. The five minute period was approximately the amount of practice time the other groups spent each session using the hand as a pacer while reading.

Certain common procedures were applied to the other three groups. Each group on day two was given a demonstration of the use of the hand as a pacer. The importance of hand-eye coordination was explained with the help of prepared transparencies. Three basic drills were used to teach speed reading, the hand was used as a pacer in all three drills.

The first drill consisted of reading for one minute and counting the number of lines read. The students were then instructed to try to cover the same material in progressively less time: $\frac{3}{4}$ minute, $\frac{1}{2}$ minute, and $\frac{1}{4}$ minute, as outlined in Figure 1. The mental practice group was allowed to read for the first minute: they were then asked to close their eyes and to imagine successfully covering the same material in the three shorter time periods, using the hand-eye coordination technique. The actual

Trial 1—Read 1 min.

Trial 2—Practice $\frac{3}{4}$ min.

Trial 3—Practice $\frac{1}{2}$ min.

Trial 4—Practice $\frac{1}{4}$ min.

Figure 1
Less time — same material drill

practice group practiced each drill by covering the same material in less time while actually reading the material and physically using the hand-eye method. The group with both instructions first practiced physically for one minute, mentally for $\frac{3}{4}$ minute, physically for $\frac{1}{2}$ minute, and then mentally for $\frac{1}{4}$ minute. The next time this drill was introduced the part previously practiced physically was practiced mentally, and that which was practiced mentally was repeated physically.

Drill two consisted of reading for one minute using the hand as a pacer, and then repeating the drill three times. Each repetition had new material added, amounting to 100% of that covered in the first trial, as shown in Figure 2. Only one minute was allowed for each trial. As in drill one all Ss practiced according to specific task instructions.

Trial 1—Read (1 min.)

Trial 2—Practice 2 times original amount read.

Trial 3—Practice 3 times original amount read.

Trial 4—Practice 4 times original amount read.

Figure 2
Same time — more material drill

The third drill consisted of reading for one minute and then, during each additional trial, previously read material was dropped at a rate equivalent to 50% of the material covered on the first reading, while new material, equivalent to 100% of the original material, was added. This procedure is outlined in Figure 3. This drill was repeated three times with only one minute allowed for each trial. The mental practice group

- Trial 1—Read (1 min.).
- Trial 2—Practice 1.5 times original amount read.
- Trial 3—Practice 2 times original amount read.
- Trial 4—Practice 2.5 times original amount read.

Figure 3
Same time — drop and add drill

practiced physically during the first trial and in imagination during the three additional trials. The actual practice group practiced the drill physically during each trial. The last group alternated physical and mental practice on the trials, as before.

During each of the four practice sessions intervening between the pre- and post-tests, the three groups managed to practice each drill twice. Between each drill all Ss were asked to read for one minute, using the hand as a pacer, giving them a total of 5 minutes additional reading time each session. For their own records, the students calculated their reading on this fifth one minute trial each session.

Results

As a check that there was initially no significant difference between the groups due to a failure of randomisation, a one-way analysis of variance was carried out on the pre-test raw scores (NDRT, Form A).

A one-way analysis of variance was also carried out on the post-test (NDRT, Form B) scores to determine whether there were significant differences between groups after treatment. The results of this one-way analysis of variance are shown in Table 1. Significant differences are found in the case of Vocabulary and Reading Rate. For Comprehension, however, means do not differ significantly.

TABLE 1
SUMMARY OF THE ANALYSIS OF VARIANCE FOR POST-TEST
SCORES OF VOCABULARY, COMPREHENSION AND READING RATE

Source	Sum of Squares	Mean Square	df	F	p	Remarks
Vocabulary Post-test	902.60	225.65	4	2.82	.03	Sig.
Comprehension Post-test	987.56	246.89	4	2.30	.06	N.S.
Reading Rate Post-test	845,250.00	211,312.50	4	8.49	.01	Sig.

The differences being significant for Vocabulary and Reading Rate, Newman-Keuls comparisons (Winer, 1962) for ordered means were made, the significance level of .05 being taken as criterion. As outlined in Table 2, post-test means for Vocabulary showed significant differences in favor of three experimental groups when compared with the no practice group. These groups were the hand as pacer, physical practice, and the mental plus physical practice groups. Post-test means for Reading Rate showed significant differences in the mental practice, physical practice, and mental practice plus physical practice groups when compared with both the no practice group and the hand as pacer group. No significant differences were found between the means in any other group comparisons for Vocabulary and Reading Rate.

TABLE 2
POST-TEST SCORES FOR VOCABULARY AND READING RATE

	<i>Vocabulary</i>	<i>Reading Rate</i>
No Practice	21.59	278.59
Hand as Pacer	29.94*	393.25
Mental Practice	26.50	503.43* +
Physical Practice	29.80*	530.20* +
Mental Plus Physical Practice	30.43*	556.79* +

Difference from "no practice" group. * Sig. at $p < .05$
Difference from "hand as pacer" group + Sig. at $p < .05$

Discussion

None of the treatments yielded a significant difference in scores on Comprehension when compared to the average score of the no practice control group. In other words, those groups which learned to read faster did so without suffering any loss in comprehension. It should be pointed out, however, that only the kind of comprehension being measured was a knowledge of what was read (facts) rather than ability to integrate the newly acquired information in a meaningful way, or to relate it to what is already known. This outcome is commonly reported.

Reading Rate showed the greatest variability from group to group on post-test scores. The groups can be placed in an ascending order according to their mean rates as follows: no practice, hand as pacer, mental practice, actual practice, both sorts of practice. These results suggest that mental and physical practice can be used effectively to improve reading rate. In addition to out-stripping the other groups in increased reading speed, the combined mental and physical practice group also seemed to enjoy class time more, possibly due to the variety of activities. That this kind of group shows the greatest gain has also been documented by Clark (1960) and Jones (1964).

The three treatments, mental practice, physical practice, and combined practice proved to be about equally effective in producing significant improvements in reading rate when compared with the no practice

group. The hand as pacer group showed an improvement from pre-test to post-test in reading rate, but no difference as compared on post-test with the no practice group.

When measuring changes in Vocabulary, three groups—hand as pacer, physical practice, and mental plus physical practice, showed a significant improvement when compared to the no practice group. The mental practice group did not show significant improvement over the no practice group when tested on Vocabulary. Since most of the drills were practiced with eyes closed and were performed mentally, this finding is probably not surprising.

The use of the hand as a pacer was surprisingly effective and this group's performance exceeded expectations; Ss showed an increase from pre-test to post-test for both Vocabulary and Reading Rate.

This study, designed to measure the effects of mental practice on the learning of rapid reading skills, indicates that Ss benefitted from using this method. The value of mental practice might be due to improved confidence, increased relaxation, additional analysis of the task, improved organization of action, and increased concentration. The present study shows that mental practice can enhance learning of rapid reading skills. But the questions, why and how does mental practice lead to improved reading performance were not answered.

References

- Arnold, M. B. On the mechanism of suggestion and hypnosis. *Journal of Abnormal and Social Psychology*, 1946, 41, 107-128.
- Buros, O. K. *The sixth mental measurements yearbook*. Highland Park, N.J.: Gryphon, 1965.
- Clark, L. V. Effects of mental practice on the development of a certain motor skill. *Research Quarterly*, 1960, 31, 560-569.
- Corbin, C. B. The effects of covert rehearsal on the development of a complex motor skill. *Journal of General Psychology*, 1967, 76, 143-150.
- Egstrom, G. H. Effect of an emphasis on conceptualizing techniques during early learning of a gross motor skill. *Research Quarterly*, 1964, 35, 472-481.
- Jones, J. G. Motor learning without demonstration of physical practice, under two conditions of mental practice. *Research Quarterly*, 1964, 36, 270-276.
- Perry, H. M. The relative efficiency of actual and imaginary practice in five selected tasks. *Archives of Psychology*, 1939, 34, 5-75.
- Richardson, A. Mental practice: a review and discussion. *Research Quarterly*, 1966, 38, 95-107.
- Sackett, R. S. The relationship between amount of symbolic rehearsal and retention of maze habit. *Journal of General Psychology*, 1935, 13, 113-130.
- Start, K. B. Relationship between intelligence and the effect of mental practice on the performance of a motor skill. *Research Quarterly*, 1960, 31, 644-649.
- Twining, W. E. Mental practice and physical practice in learning a motor skill. *Research Quarterly*, 1949, 20, 432-435.
- Vandell, R., Davis, R., & Clugston, H. A. The function of mental practice in the acquisition of motor skills, *Journal of General Psychology*, 1943, 29, 243-250.
- Winer, B. J. *Statistical principles in experimental design*. New York: McGraw-Hill, 1962.

S. A. PERKINS

A Pilot Study of the Values of Public and Separate School Grade Twelve Students

A Differential Values Test devised by Thomas was administered to 78 Public School Grade Twelve Students and 62 Separate School Grade Twelve Students in Lethbridge, Alberta. Significant differences were found on the aesthetic, intellectual and material values scales but not on the humanitarian, power, and religious scales. However, in comparing the sexes a different pattern emerged in that the differences between the male students were on aesthetic and intellectual values and between the girls were on material and religious values. Possible reasons for these differences in terms of home influences are discussed. (Dr. Perkins is an Associate Professor of Educational Psychology at the University of Lethbridge.)

Catholic parents send their children to separate schools because they are "in general agreement that the objectives of religious education can best be realized in an atmosphere wherein spiritual and supernatural realities hold their proper place in the hierarchy of values" (McLuskey, 1968). The key words here are atmosphere and values. Apart from these factors and formal instruction in religion, the Catholic school and the public school seem to be substantially similar. The entire separate school system is based on the assumption that certain values and norms of behavior can be acquired by the Catholic student through precept, example, and training (Fichter 1958). In reality, observation suggests that in organization, curriculum, activities, standards and educational results, there is little to differentiate the educational objectives of the average separate school from the public school in Alberta, due to the regulating influence of the Provincial Department of Education.

Social scientists, on the other hand, adopt a "sceptical view concerning the efficiency of formal schooling for the teaching of values. The view of formal education as an omnipotent socializing agent shows an exaggerated regard for education." (Greeley and Rossi, 1966). Since the social scientist is sceptical of the ability of schools to develop value orientations, he

will only grudgingly accept proof for the proposition that schools indeed develop values.

It may well be that formal skills are learned in the classroom. The classroom may also contribute to the transition from the family to the larger society. It is not evident, however, that formal education really has much influence on cultural values. Most research suggests that the more intimate settings of household, neighborhood, friendship, and workplace provide more effective modes of socialization than formal instruction (Greeley and Rossi, 1966).

To ask if religion has been effective in the separate Catholic school is tantamount to asking what effect Christianity has had on civilization. Faith in the efficacy of the school is astounding, and Catholics too regularly share in the mystical expectancy that the school can do anything and everything. (McLuskey 1968)

Research by Brother (1964) in England supports the view that "there is no relationship between Catholic secondary education and associational activity in later life." Most of the research literature available indicates that "the changes in value orientations which do occur in the schools are limited and conditioned by the previous experiences of the student in his family milieu" (Greeley and Rossi, 1966) even though "the entire educational system is based on the assumption that certain types of behavior can be acquired in the social system" (Brookover, 1955).

The purpose of this pilot study was to determine whether grade twelve students of full separate Catholic education in Alberta differed substantially in their values from grade twelve students of full public school education.

In particular, the investigator was interested in determining whether the values of separate and public school, grade twelve students who were on the senior matriculation program differed in any way according to the Differential Value Profile.

The following hypotheses concerning the values of separate and public school grade twelve senior matriculation students as measured by the Differential Value Profile (D.V.P.) were explored in this pilot study.

1. Separate and public school students (groups of both sexes) will respond similarly to the D.V.P. scales
2. Separate and public school male students will respond similarly to the D.V.P. scales
3. Separate and public school female students will respond similarly to the D.V.P. scales

Method

Instrument

Thomas (1967) first developed the Differential Value Profile in 1963. The test, which can be administered as a group test, consists of 134 statements designed to sample personal opinions. Responses are given on a four point scale. The value scales for subjects are: aesthetic, A; humanitarian, H; intellectual, I; material, M; power, P; and religious, R. Each value scale is scored by hand by placing one of six stencils over the standardized answer sheet.

The D.V.P. manual demonstrates good evidence of content validity with a high degree of inter-judge agreement, all coefficients being well above the .01 level of significance. As the test constructor is cautious to point out, all validity studies at the time of publication applied to groups and not individuals. Estimates of the D.V.P. reliability using the K-R formula shows the six total scale coefficients ranging from .86 to .99.

Sample

Participants in this pilot study were seventy-eight public school and sixty-two separate school, grade twelve senior matriculation students in Lethbridge, Alberta. They were tested in their respective schools during May, 1970.

Results

Hypothesis I

Table 1, which compares the values of public and separate school students (combined groups of both sexes), shows that three value scales, Aesthetic, Intellectual and Material show significant differences between the two groups ($p < .01$). In the case of Aesthetic value, the results indicate that the separate school (Catholic) students place more emphasis on Aesthetic values than do public school students. On the other hand, public school students show significantly greater scores on Intellectual and Material values as measured by the D.V.P. ($p < .01$). Hypothesis I is rejected as the public and separate school students did not respond similarly on the D.V.P. scales.

TABLE 1
A COMPARISON OF GRADE TWELVE STUDENTS
ON THE DIFFERENTIAL VALUES TEST

	Public N=78		Separate N=62		t Test
	Mean	S.D.	Mean	S.D.	
Aesthetic	18.74	4.74	21.00	5.19	-2.662**
Humanitarian	21.92	5.94	23.18	6.02	-1.225 N.S.
Intellectual	22.36	4.71	20.13	4.94	2.702**
Material	16.00	6.05	12.58	6.63	3.160**
Power	13.31	5.03	14.02	5.60	-0.781 N.S.
Religion	14.18	9.74	16.84	7.99	-1.723 N.S.

** $p < .01$
N.S. Not Significant

Hypothesis II

A comparison of public and separate school male students in Table 2 reveals that these two groups differ in score on the Aesthetic value scale, ($p < .05$). This indicates that the separate school male students are more inclined towards Aesthetic values than are public school male students. Public school male students demonstrate significantly higher Intel-

lectual scores ($p < .01$) than separate school male students. As public and separate school male students did not respond similarly on the D.V.P. scales, hypothesis II is rejected.

TABLE 2
A COMPARISON OF GRADE TWELVE MALE STUDENTS
ON THE DIFFERENTIAL VALUES TEST

	Public N=40		Separate N=25		t Test
	Mean	S.D.	Mean	S.D.	
Aesthetic	17.55	5.08	20.36	5.93	-2.001*
Humanitarian	19.87	6.30	19.08	6.03	0.495 N.S.
Intellectual	24.75	3.77	20.88	6.08	3.117**
Material	16.02	6.23	13.96	7.11	1.211 N.S.
Power	14.75	5.49	15.76	7.13	-0.632 N.S.
Religion	13.45	9.96	13.36	8.69	0.037 N.S.

* $p < .05$

** $p < .01$

N.S. Not Significant

Hypothesis III

The results shown in Table 3 indicate that scores on two of the value scales are significantly different. Public school female students show significantly higher Material values scores ($p < .01$) than do separate school female students. As far as Religious values are concerned however, the separate school female students score significantly higher than do the public school female students ($p < .05$). Hypothesis III is therefore rejected.

TABLE 3
A COMPARISON OF GRADE TWELVE FEMALE STUDENTS
ON THE DIFFERENTIAL VALUES TEST

	Public N=38		Separate N=37		t Test
	Mean	S.D.	Mean	S.D.	
Aesthetic	20.00	3.99	21.43	4.58	-1.427 N.S.
Humanitarian	24.08	4.64	25.95	4.13	-1.813 N.S.
Intellectual	19.84	4.27	19.62	3.91	0.230 N.S.
Material	15.97	5.85	11.65	6.11	3.089**
Power	11.79	3.95	12.84	3.85	-1.148 N.S.
Religion	14.95	9.44	19.19	6.51	-2.229*

* $p < .05$

** $p < .01$

N.S. Not Significant

Discussion

What are the implications of this pilot study?

The results reveal that as far as the combined sex groups are concerned (Table 1) there are no differences on Religious values as between separate and public school students. However, the separate school students show substantially more involvement with Aesthetic values than do public school students, while the public school students score higher on Intellectual and Material values than do separate school students. The reader is reminded that we are talking about values NOT abilities in these areas.

The fact that the groups do not appear to differ on the values labelled Humanitarian, Power, or Religion seems to support the view of Johnstone (1966):

the strong current of opinion and interpretation flowing throughout our society would make it extremely difficult for the parochial school to get across effectively a divergent view even if it desired and attempted to do so.

In comparing public and separate school male students, two value differences were revealed. Separate school male students scored higher on Aesthetic value while public school male students scored higher on Intellectual value on the D.V.P. At the same time, no value differences were noted for the two groups on Humanitarian, Material, Power or Religious values. It is interesting to note that in a recent pilot study Perkins (1972) discovered no differences on the six scales of the D.V.P. between Canadian and English male secondary school students. Yet, this pilot study reveals differences on Aesthetic and Intellectual values of male students living in the same culture and city.

Of the three kinds of groups compared on the D.V.P. the two female groups alone show any difference in Religious values. Separate school females score significantly higher in Religious value than do public school females. As Greeley and Rossi (1966) suggest:

adolescents from less religious families are superficially influenced by Catholic high schools but this influence quickly wanes. Those from religious families are also influenced but because of the reinforcement received in the family milieu, this influence persists.

The fact that females tend to be more conforming than males, and the fact that perhaps the Catholic females in this sample had their religious values reinforced in the family milieu more than public school females might account for the differences in Religious values between the two groups. In this regard Mary Perkins Ryan (1963) has noted that "Jewish groups have successfully formed their children religiously and culturally outside of school hours." Nutting (1959) also argues that "the home and neighborhood, not the schools, are the sources of the fundamental moral, religious, and civic attitudes." However, these generalizations leave unexpected the absence of differences between separate and public school male students.

This question can be approached from another angle. Recently the ability of the school to influence values has been challenged by Coleman. He suggests that information-poor societies of the past had a powerful

effect on a child's values. But an information-rich modern society removes the power of the school to shape values through selectivity.

Information richness removes the function of the school in extending the child's horizon through vicarious experience; and information pluralism removes from school the function of shaping the child's values through selectivity (Coleman, 1972).

The results of this pilot study are limited because of the size and selective nature of the sample. The findings cannot be taken as definite proof that a causal relationship exists between the variables investigated. It would be interesting to discover whether replication with a larger sample would reveal similar value differences.

References

- Brookover, Wilbur B., *A Sociology of Education*. New York: American Book Co. 1955.
- Brothers, J., *Church and School*. Liverpool: University of Liverpool Press, 1964.
- Coleman, James S., "The Children Have Outgrown School". *Psychology Today*, February 1972, 72-82.
- Fichter, Joseph H., *Parochial School: A sociological Study*. Indiana: University of Notre Dame Press, 1968.
- Garrett, H. E., *Statistics in Psychology and Education*. New York: David McKay Company, Inc., 1962.
- Greeley, Andrew M. and Rossi, Peter H., *The Education of Catholic Americans*. Chicago: Adeline Publishing Co., 1966.
- McLuskey, Neil G., *Catholic Education Faces its Future*. New York: Doubleday & Co., 1969.
- Perkins Ryan, Mary, *Are the Parochial Schools the Answer*. Catholic Education in the light of the Vatican Council. New York: Holt, Rinehart & Winston, 1963.
- Perkins, S. A., "A Cross Cultural Pilot Study of the Adolescent Values of Canadian and English Secondary School Students" (in press), 1972.
- Thomas, W. L., *The Differential Value Profile*. Grand Rapids, Michigan: Educational Service Company, 1967.

J. McLEISH

The Origin of Psychology as a Science: Ivan Mikhailovich Sechenov

*In the philosophical controversies of the 'forties, 'fifties and 'sixties in Russia, and in the social and political developments which paralleled these discussions, a basis was laid for the birth of an independent science which would deal with human behaviour. In his remarkable treatise *Reflexes of the Brain* (1863) Sechenov developed a detailed program which, properly evaluated, laid the foundation for an objective science of psychology not only in Russia but on a world scale. The true history of these developments, as well as the nature of Sechenov's (and later) Pavlov's contributions has been obscured since the source materials have not been available and American behaviorism grossly misunderstood and misrepresented the actual work of these thinkers. Sechenov's program, being about four decades in advance of world scientific thought (and because, for some reason, no translation of his basic writings was available until 1935 in a West-European language) remained dormant until Pavlov invented the techniques necessary for investigating cerebral processes. (Dr. McLeish is a Professor in the Department of Educational Psychology, The University of Alberta.)*

In the indictment prepared by the St. Petersburg Censors' Committee against Sechenov in 1866, he was charged with putting forward views in his book on *Cerebral Reflexes* described as follows:

This materialistic theory reduces even the best of men to the level of a machine devoid of self-consciousness and free will, and acting automatically; it sweeps away good and evil, moral duty, the merit of good works and responsibility for bad works; it undermines the moral foundations of society and by doing so destroys the religious doctrine of life hereafter; it is opposed both to Christianity and to the Penal Code, and consequently, leads to the corruption of morals.

This book, published originally in 1863 as two journal articles, is in reality a scientific treatise which seeks to establish that our so-called voluntary movements are in fact reflex actions in which there is a dis-

crepancy between the stimulation and the response evoked. More than any other work, it can be said of it at this present time, that it heralds the establishment of an objective science of psychology. It was welcomed by Russian scientists and violently attacked by Russian philosophers. It led quite directly to the establishment of "reflexology" claimed to be the objective science of behaviour by Bekhterev; more importantly, it provided Pavlov with his scientific programme of forty years' work on higher nervous activity ("behaviour"); indirectly it fathered American Behaviourism and the whole movement in world psychology away from philosophical analysis and subjectivity in the direction of experimental science and objective methods.

Sechenov worked in the laboratories of Helmholtz, Du Bois Reymond, Ludwig, Bunsen and Magnus in Germany, with Brücke in Vienna and with Claude Bernard later in France. He was almost certainly familiar with the famous pact entered into by Helmholtz, Brücke, Du Bois Reymond and Ludwig, that they would establish and compel the acceptance of this truth: that "no other forces than common physical and chemical ones are active within the organism". Sechenov extended this principle in a novel way to include the "so-called psychical activity" (the phrase is Pavlov's). He did this, not in the sense of reducing psychic events to laws of physics and chemistry but rather by demonstrating that the three concepts of: (1) the organism-in-its-environment, (2) the tri-member reflex, (3) the process of inhibition and/or intensification of response, provided a model perfectly adequate to explain all animal and human behaviour.

In 1863, he was far in advance of West European thought: the social and political blight of Tsarism had the effect of polarising opinion so that views which were presented within a climate of compromise, hesitancy and temporising in the rest of Europe were taken up by Russian thinkers and developed to their extremist, logical conclusion.

It was Wöhler's synthesis of urea from inorganic materials in 1832 which overthrew the theory that some special "force" distinguished living chemical processes from non-living. The principle of the unity of all chemical processes, both "organic" and inorganic, was joined in 1847 by Helmholtz's declaration of the law of conservation of energy. Darwin's theory of evolution by natural selection in 1859 gave the death-blow to all teleological explanations in natural science. Sechenov was then thirty years of age. This was the scientific *milieu* in which his formative years were spent. His social and political views were formed in the period when Herzen and Chernishevsky were calling for radical changes in Russian society and a new foundation for philosophic thought purged of the subjectivity and spiritualism of Hegel and Schelling.

Even in his doctoral thesis on *Data for the Future Physiology of Alcoholic Intoxication* (1860) Sechenov put forward a consistent materialist viewpoint. In this work, in addition to his experimental studies of alcohol and other chemicals in the blood, he stated the various principles which guided him later in his writings on psychic processes. These were: the unity of the organism and the conditions of its existence; the unity of the forces of organic and inorganic nature; the need to unravel the mysteries of consciousness by objective methods.

For materialism, the recognition of the primacy and existence of the objective world, external to man and independent of his perceptions, wishes and very existence, is absolutely basic. This is the great dividing line which distinguishes materialism from all other philosophical viewpoints. Under the influence of Beneke's *Psychological Sketches*, and his *Theory of Education*, texts which he studied out of interest whilst a student at Moscow University, Sechenov became an extreme idealist—"the whole picture of psychological life came out of the primary forces of the soul". But under the influence of his German teachers he was led to adopt materialism as his basic premise.

Recognising the objectivity of the external world, Sechenov advanced the idea that *all* our psychic activity is the result of environmental stimulation. In other words, the initial cause of every human action lies outside of man. Not only that, but in his psychic and motor activity man is subject to the same laws as appertain to the material world. Contrary to idealism, there is only one set of causal laws: these govern not only man's bodily functions but they apply to his psychic life as well. This does not mean that chemical and physical laws are adequate to explain psychic processes, but rather that in explaining psychic processes we cannot assume that their uniqueness absolves them from operating under the restraints of scientific law. The most general scientific law is causality; next are the laws of conservation of mass and of energy. In the natural sciences we have the law of development from lower to higher forms of life. In the special sciences of physics, chemistry, biology and physiology there are particular laws which refer to specified situations. We must assume that all these discovered relationships apply in the study of man, *unless there is specific scientific evidence to the contrary*. The scientific study of human behaviour means, and can only mean, the establishment of causal relations in this area. It is only on this basis that a science of psychology is possible:

It may be that psychology will shed some of its brilliant and universal theories; huge gaps may appear in its actual knowledge; instead of explanations we will get in most cases the laconic phrase: "We do not know"; the essence of the psychical phenomena, insofar as they are manifested in consciousness (like the essence of all other natural phenomena) will still be concealed from us. And yet psychology will have made a tremendous advance. It will no longer be based on erroneous reasoning prompted by the misleading voice of consciousness; it will rely on positive facts, on verifiable propositions. Its generalizations and deductions, strictly confined to real analogies, will no longer depend on the taste and whims of the investigator, which in the past brought psychology to transcendental absurdities; they will acquire the character of truly objective scientific hypotheses. The subjective, the arbitrary and the fantastic will give way to more or less reliable knowledge. In short, psychology will become a positive science.

The principle that the organism is inseparable from the environment was developed by Sechenov in various forms, since it is basic to an understanding of behaviour. In the first place, given the fact of this dependence and inter-relationship, it is nonsense to talk about man as a "free spirit"—there can be nothing autonomous about the psychic life, it is *organically* interconnected with bodily processes; these in turn are inseparably linked

to the environment. Man's psychic life can be divided into two aspects, the mind and the feelings: this distinction is made by "common psychology" (that is, by introspection). Sechenov is prepared to accept this as a working model. Sensation, perception, memory, thought appertain to the mental sphere; to the emotional belong fear, pleasure, love, enthusiasm, ecstasy. These phenomena of the psychic life are all engendered by the functioning of the brain within the somatic system; the initial impulse which starts off a train of psychic acts comes invariably from the environment.

The entire psychic life of man is associated with the nervous system: this is stimulated, perceives, and reacts to, changes in the external reality which surrounds the organism. Psychic life is inconceivable without external stimulation of the sense organs. There is also, of course, a process by which the nervous system responds to changes in man's internal environment—that is, the organs, muscles, tendons, etc. which constitute the body. The law which governs all these phenomena, and nervous processes in general, is, of course, the law of causality—there is nothing random, chance, uncaused in man's psychic life. Acts take place in the mind always as an effect, and never as an arbitrary act of the free will.

The question of whether the most voluntary of all voluntary actions of man depend on external and internal conditions has been answered in the affirmative. From this it inevitably follows that given the same internal and external conditions the activity of man will be similar. Choice of one of the many possible ends of the same psychical reflex is absolutely impossible; its apparent possibility is merely a delusion of self-consciousness.

Thus man's psychic life is a process of interaction with the object of his external environment. In the course of this interaction, beginning in childhood, a complex, evolutionary development takes place. In his *Reflexes of the Brain*, Sechenov sought to demonstrate from an evolutionary account of individual development how thought and consciousness originate as the result of inhibition or suppression of the last member of a reflex reaction to an environmental stimulus. The ability to think, to meditate, to reason, is signified by the chain of inter-connected notions and concepts which exist in man's consciousness at any given moment and which are *not* expressed in any external manifestation. "A thought is the first two-thirds of a psychical reflex".

The capacity to inhibit particular responses is also a learned activity: it is acquired by means of reflex associations in the course of human life. For Sechenov the concept of inhibition is absolutely central (no pun intended), from the point of view of the development of his theory of psychic activity it is almost more basic than the process of excitation. In the history of physiology his name will always be associated with the discovery of "central inhibition". This process can be demonstrated by placing salt on the cut end of the spinal cord of a decapitated frog: spinal reflexes, previously obtained by pinching the frog's leg (reflex withdrawal being the response) are completely suppressed.

By an extension of the argument to man, he deduced that spinal reflexes can be, and are, inhibited by the cerebral cortex: he succeeded in localizing the process in an inhibitory centre ("Sechenov's centre") in the brain. The essence of his theory is that *all* conscious and unconscious acts are reflexes and that the so-called "higher mental processes" char-

acteristic of human beings are the product of the inhibition of the motor response which is characteristic of reflexes at the spinal level. Consciousness, which distinguishes man from the animals, arises on this basis "as a kind of mirror, reflecting the surrounding reality". It seems to have no beginning and no end; the picture it presents is ever-changing, extremely variegated, not to say chaotic.

Consciousness can hardly be regarded as the ideal object of study. Neither is introspection to be considered the method of choice in studying the thought process. Because many of the links in the sequence of psychic acts, as these appear in consciousness, are missing, thoughts appear to be the original products of consciousness. But this is one of the main errors which necessarily result from the use of introspection as a method of investigation: it leads on to the second basic error—that of concluding that there is some choice of alternative courses of action. The real relationship between psychical activity and the external agents which initiate it and influence it as cause must ever remain obscure to introspection, since the subjective method cannot isolate the basic unit of scientific study, namely the psychic act. "The concept of a psychical act as a process or motion having a definite beginning, course and end, must be retained as fundamental".

This leads to the proposition that there is an affinity between psychical acts and nervous processes in the body. The reflex arc is the basic unit of physiological analysis, the psychical act is the basic unit of consciousness. In fact, the psychical act is simply a cerebral reflex: in certain cases the response termination may be *suppressed* (as in thinking), in others it is *intensified* (as in emotion). All acts of conscious or unconscious life, without exception, are reflexes by origin. Thus, the essence of Sechenov's teaching is that there are three separate mechanisms which control all man's psychic activity—the reflex arc, the inhibitory mechanism and the intensification mechanism. All talk about "Special Forces" is not only idle chatter but represents a return to animistic ways of thinking.

The essence of all philosophical theories concerning the body, the spirit and the objects of the external environment is based (according to Tylor) on real but wrongly interpreted facts. For our particular purposes we could add: "on the facts of life wrongly interpreted, because the savage is too ready to accept the voice of his self-consciousness." Actually the philosophy of primitive man starts out from the same basic psychical predispositions as the philosophy of the thinker of today who is guided solely by the voice of his self-consciousness.

Idealist psychologists such as Kavelin, with whom Sechenov engaged in controversy, imagine that there is some kind of inner vision: this originates from an alleged faculty with which the soul divides itself into two parts while remaining a single whole, one part critically looking at the other. The idealists teach that the human psyche is in this way unique and bears no resemblance to any organism, in the same way as they used to teach that organic objects bear no resemblance to inorganic materials, before Wöhler.

Sechenov takes this argument to be the *reductio ad absurdum* of psychological method—as indeed it is! He takes the view that physiology alone has the objective, scientific method essential for studying not only

the material substratum of consciousness but psychical activity as well. The object of study is in both cases the same, namely, the reflex act. The method is analysis of the objective connections between psychical acts and surrounding reality.

In a series of essays which have remained virtually unknown to Western psychologists, since they were published in relatively obscure Russian journals, Sechenov worked out in considerable detail a materialistic theory of the higher mental functions in man. Basing himself on Helmholtz's researches on vision and hearing, and Herbert Spencer's developmental theories, Sechenov stated certain basic positions which have only recently come into Western psychology through the work of Piaget. Whilst not rejecting the method of introspection entirely, Sechenov made little use of the findings of the "subjective" schools, having decided that a new kind of investigator was necessary before any progress could be made. He characterises the main defects of the subjective method as being an exclusive reliance on observation (which turns out to be, in fact, self-observation); an undue confidence in the voice of self-consciousness; the multiplication of special forces and faculties such as will, memory, attention and imagination; the deplorable habit of forgetting about the figurative and symbolic character of language, this leading to the vicious error of accepting a name as proof of the existence of a faculty or process.

The objective method of "physiologico-psychology" demands a new kind of investigator who would study psychical phenomena from the physiological point of view. In the meantime, awaiting the arrival of such a person, Sechenov developed a program of study for this investigator. In all this work, Sechenov was guided by two basic principles: that the higher mental processes in man are directly associated with the material structure of the sense organs and central nervous system, and, secondly, in spite of this limitation, our sensations, concepts and mental processes in general provide correct reflections of external reality. He attacked metaphysics quite directly on the grounds that it illicitly isolates man from all the conditions of his earthy life; it also, and equally illicitly, separates the mind from the sense-organs.

It is true that the external world exists apart from man and has its independent life, but man acquires knowledge of this world solely through his sense organs because the results of their activity are the source of all mental life.

In a remarkable article *The Elements of Thought* (1878), Sechenov analysed the origin of thinking, beginning with the most elementary reflex processes and ending with abstract thought. Following Darwin and Spencer he begins by stating the basic principle that we should begin the study of the thought process by investigating the mental life of the child. It is here that we can observe the shaping of thought from psychological products of a lower order. The source of thought lies in sensation—this is so in the child where the relationship is quite direct; in the adult the process is more complex. Adult thinking, in contrast to that of the child, takes place in terms of *systems*, not of units; it is also accomplished in terms of *abstractions*, not of sensory concrete objects.

Moreover, adult thinking works in terms of a long chain of ideational transformations so that both product and process are quite cut-off from their sensory roots. The problem is therefore to identify the developmental sequences which link the concrete, sensation-bound thinking of the child with the abstract, supersensual thought processes of the adult.

Sechenov makes the point that until the physiological mechanisms associated with our perception of the external world have been identified (and this only happened in the second half of the 19th century—Corti, Meissner, Wheatstone, Helmholtz, etc.) theoretical studies of thinking were condemned to use the abortive method of studying ready-made patterns of thought embodied in speech. This meant that it was impossible to study the basic, primary forms of thought in the order of their development since the elementary forms of sensation peculiar to the child no longer exist in the consciousness of the adult. Knowing the structure and functioning of the receptor organs as a consequence of the work of the physiologists mentioned, we can identify the nature of these elementary sensations. Anatomy and physiology can thus to a considerable degree substitute for actual observations on children. At least, this knowledge provides the scientific model in terms of which sensation must be explained. Herbert Spencer provides the other half of the model so to speak, in his hypothesis about the successive stages of neuro-psychic development: he supplies the key with which to solve the riddle of how thought develops from sensation.

In identifying the typical form of thought as a *sentence* consisting of three parts (subject, object, predicate) Sechenov cuts the Gordian knot of the relation between thinking and speech. The process of thinking in its most basic and general form is thereby identified as a confrontation between objects related to each other in terms *either* of similarity, co-existence or succession. These objects and relations exist in reality. Thought is a reflection of these real objects and real relations. In the intellectual development of the child there is a multiplication of the objects of thought: this increases the number of confrontations possible. There is also a continuous development of symbol formation and abstraction. But when the development is complete, even at the highest level of intellectual and moral discourse, there is not a single relation between the objects of thought which cannot be discovered in object thinking.

It might seem that man, after his primary acquaintance with the external world, transfers all the links, interdependences and interrelations between the objects already known to him to new objects, despite the fact that in the eyes of man, these links and relations are real when they are in their proper place, and assume a conventional or figurative sense when the transfer takes place.

The whole process begins in sensation and in the perception of the external world. The succession of similar and of different objects preceived by the child leads to *comparison*. Here, by a natural process, the mental expression of a particular object is transformed into a symbol or sign which designates a class or group of related objects. This entails a process of *analysis* whereby separate parts of objects are identified, and given a symbol. Analysis leads on to *synthesis*: there is a reunion of the

separated parts by virtue of their co-existence or succession in time. These three basic transformations of sensation represent the ways by means of which primary sense-data are transformed into ideas.

Sechenov accepts Locke's contention that the child begins life with no mental content. This is the "premental stage". The child then passes into the "sensory" phase where the external world provides material or stimuli for sensation. This material is transformed into sensory products of the mind by the maturing sense organs. The third stage is that of "object thinking": here the relations and connections, the interdependencies between objects are reflected in consciousness. Object thinking consists of the *elucidation* of these relationships. The fourth stage is that of adult thinking. Here more complex and abstract concepts and relations are generated by combining the various simple forms and raising the whole process to a new super-sensory level of abstraction. At this stage thought appears to have a life of its own: it has the appearance of being completely independent, and even divorced entirely from environmental connections. But even mathematics and metaphysical thinking represent a series of sensory signs moving along definite neural pathways.

The whole process of development consists of an ever-increasing differentiation of primary undivided forms (sensory products in the shape of nerve impulses which owe their existence ultimately to environmental influences). These act on a pre-existent and inborn organization of matter (man's central nervous system). This formulation of the problem in terms of the interaction of two factors—inborn organization and external influences—is taken from Spencer. It puts an end to the existence of the different schools in psychology which existed in Spencer's day. Sechenov's great contribution is to work out in detail the actual changes that occur in the primary materials and in the nervous system, parallel with the development of the thinking function. This is done on the basis of known and established physiological data and laws. In the course of this exposition Sechenov develops views about attention, memory, the concepts of time, space and causality, mathematical thinking, etc., which have been, and remain, extremely influential in the development of Russian psychology.

Sechenov had a number of distinguished pupils and disciples, including such well-known physiologists as Pashutkin, Wedensky and Samoilov. These studied under him directly. In addition, Pavlov, Bekhterev and Ukhtomsky were strongly influenced by his writings. On the other hand, his views were under strong attack by idealists such as Strakhov, Kavelin, Edelson, Stadlin and Chelpanov. He found it necessary, in view of the persecution to which his writings were subjected by the censors, to defend himself against the charge that his theories undermined morals and human responsibility. This was done in an article on the theory of freedom of the will, published in 1881. In this, he defended the view that nothing was changed in practice with regard to rewards and punishments, culpability and innocence, if we accept that human actions are subject to the law of causality. What changed was our *attitude* to the offender.

In the absence of free-will, society must of necessity regard the defects of its members as products of a hereditary pre-disposition, ignorance, un-

couth manners, bad upbringing, lack of brains, poverty, idleness, laziness, etc.; consequently, it is not entitled to treat its vicious members in a spiteful way, and all the more so to punish them for their misdeeds. But society is obliged to isolate such defaulters and to try to reform them, just as it is obliged to take care of those who are mad or sick. . . . Consequently, the external aspect of the action by which society protects itself from its vicious members remains invariable, no matter whether free-will is recognised or not. The only change is in the sense of the actions—retribution is replaced by the concept of reformation.

Sechenov maintained that the moral value of an act is determined by its aims and the conditions under which it is performed. The question whether it was, or was not, a result of free will has really no relevance—the so-called psychogenetic aspect must ever remain concealed from us. As far as corrupting morals is concerned, the moral sense develops in exactly the same way as the aesthetic sense, through education and example. This is the basis of moral behaviour, not the metaphysical fiction of the free-will. Action is a conscious thing, conscience and reason take part in it. If we accept the theory of causal determinations, man can equally be regarded as a moral and rational being as if we accept freedom of the will. Far from denigrating man, the theory of the dependence of human actions on the conditions of the external and internal environment teaches us tolerance towards our neighbours, meekness in ourselves, faith in the triumph of good and the reformation of evil.

References

- Sechenov, I. M., *Sochineniya*, St. Petersburg, 1908. 2 vols.
Sechenov, I. M., *Izbranniye filosofskie i psikhologicheskie proizvedeniye*. Politizdat, Moscow, 1947; ed. Koshtoyanz, 2 vols. Moscow 1952-1956.

A. FORREST

Clarendon's *Dialogue Concerning Education*: A Neglected Document in Seventeenth-Century Educational History

That Clarendon was sufficiently concerned about education in his day to write a tract on the subject has been almost totally overlooked by historians. His work takes the form of a "dialogue", whose participants reflect in the flow of debate the spectrum of educational opinion among those "persons of quality" to whom Clarendon himself belonged. The state of the English Universities, the importance of the Inns-of-Court, the plight of the younger sons, the educational value of travel and the theatre are all considered. Illuminating thus the social history of the time, and presenting the thoughts of an eminent Royalist statesman, Clarendon's Dialogue ought to assume a significance at least equal to some of the better-known Puritan tracts.

A Royalist Tract

Among historians, literary critics and others, Edward Hyde, first Earl of Clarendon (1608-74), is generally noted for his central involvement in the political life of his time, for his association with lawyers, poets and the scholarly group at Great Tew, for his monumental *True Historical Narrative of the Rebellion and the Civil Wars*, and for his *Contemplations on the Psalms*. He is, however, except for his administrative work as Chancellor of Oxford and for lending his name to the most venerable of scholarly presses, not normally known for his connection with education. This is unfortunate, for he is the author of *A Dialogue concerning Education*, which is not only a valuable social document, but also an appealingly humane work of considerable literary merit.

This tract has a number of claims upon our attention. Most historians of education working in the period do not appear to be aware of its existence, yet it expresses the views of an eminent and powerful aristocrat, who was both actor on, and chronicler of, the stage of English public affairs during its most turbulent period. Reasons why the tract has been

universally overlooked are, of course, not far to seek. The *Dialogue* apparently remained in manuscript form, perhaps being privately circulated among friends, until the early eighteenth century, when it was partially hidden (or indecently buried) by inclusion in a collection of miscellaneous tracts, *A Collection of Several Tracts, published from his Lordship's original manuscripts* (London, 1727); and since the work has never been edited and published separately, it has remained unnoticed and obscure. Scholars may also have been blinded by the fact that Clarendon was not a member of the party which created most of the educational ferment during the English revolutionary period, while his claim to the title of educationist has undoubtedly been overshadowed by his fame as political historian and statesman. But whatever the causes of this serious neglect, there is no question about the tract's worth. Clarendon's discourse on education is possibly most valuable, because it gives the testimony of one, who, during the Civil Wars prominently upheld the Royalist cause. This is a side not frequently heard about in surveys of seventeenth-century educational thought. To place, for purposes of comparison and contrast, Clarendon's views beside the much more widely-known opinions of the Parliamentary Milton can be illuminating, especially when we reflect that these men were almost exact contemporaries. Moreover, the piece is not only interesting for the educational ideas it expresses, but remarkable also as a work of literary art. Its use of the dialogue-form, which is a fairly common literary *genre* of hallowed lineage, allows for the give-and-take of debate, of discussion which clarifies the issues, permits the modification of stands and urges the fairness of a central position. Throughout appear all Clarendon's exceptional gifts of colloquial discursiveness and character-realization that are so eloquently displayed in his more famous works. Indeed, from this point of view, Clarendon's *Dialogue concerning Education* by no means suffers by comparison with Milton's *Of Education*.

To ascertain the date of composition, we have apparently no external resource beyond the knowledge that the *Dialogue* was not published before 1727; consequently, we must be guided by internal evidence alone. And here the most eloquent witness resides within the text itself, especially the lengthy debate about the stage. This ranges far beyond a mere discussion of the educational value of plays to a consideration of grave allegations that constituted the main substance of the Puritan attack on the theatre, especially during the middle and late 1630's. From such testimony it may be reasonably conjectured that the *Dialogue* was written at a time when controversy over the theatre still raged among intellectuals. At the latest, a date of 1646-48 might be assigned on the strength of Clarendon's having leisure to give his mind to it, during the period of his first exile in Jersey. In any event, the work can be placed quite close to Milton's *Tractate*, published in 1644.

Although the *Dialogue concerning Education* is a wholly independent work with a unity of its own, it is actually a sequel to another dialogue in the same volume of Clarendon's papers. It follows *A Dialogue between A. an old Courtier, B. an old Lawyer, C. an old Soldier, D. an old Country Gentleman, and E. an old Alderman, of the want of Respect due to Age*. When an attempt is made to pursue the subject of education in this dia-

logue, the old Soldier (or Colonel) abruptly breaks off the topic, saying;

I will wholly decline one Argument in which all of you have enlarged very much; that is, of Education: which though it may naturally enough fall into the Argumentation in which we are now engaged, and probably is a real Cause of those Defects, and that Degeneration which is so grievous to you; yet I look upon it as so fit to be an Argument apart, and not to be mingled with any other, that whereas one of you threatened to fine the Alderman another Dinner, I shall concur with you in that Vote, and dedicate that Afternoon to another Conference in this Place upon that Subject of Education, which without doubt deserves a very deliberate Disquisition. (*Dialogue*, p.301)

At the end of the discussion, the Alderman recalls this, and he proposes a further meeting in a couple of days' time, at which he will provide dinner, for the purpose of debating education. There is, however, to be an addition to the present assembled company; the Alderman announces that he will invite his friend, "the good Bishop", who "having been well bred himself, and seen Foreign Parts, will supply [them] with any necessary Animadversions and useful Reflections" (313). Such, then, is the setting for the work that immediately follows, which is our text: *A Dialogue between the same Persons and a Bishop, concerning Education*.

Dialogue on Education

The company having assembled, the Colonel at the outset offers a definition of the aim of education: "to dispose Men from Children to Wisdom and Virtue, whereby when they come to be Men, they may be delighted to tread in the same Paths" (313). This is the objective he would seek to attain in his scheme, comprehending only the education of 'noble and generous Persons . . . the Children of Persons of Quality, who can be at the Charge (i.e. expense), for good Education is chargeable"; the rest he would leave to "those common Ways which their Fortunes as well as their Inclinations lead them unto" (313). The Colonel goes on to say that he will talk of "Rules towards their Education", from the time that "they first begin to speak" or "even from their Entrance into the World," if anyone wishes (314). The Alderman makes some comments about education at the mother's breast, for he believes the first year of life is very important. There follows an argument as to the advantages and disadvantages of employing a "wet" nurse. The Alderman is concerned that infants should be looked after by their own mothers throughout this formative age, but the Lawyer is opposed to obliging mothers to nurse their children. This brings forth what amounts to a plea for planned parenthood from the Country Gentleman, who berates the Lawyer for being "very wanton at this Age" (314). The Bishop protests that while this may be an important stage, and while it may indeed be desirable that women nurse their own babies, the Alderman lays "too heavy a Weight upon the poor Mothers", who can hardly do as suggested, without the consent of their husbands, whose rights must be protected. The Bishop's solution is that the greatest care should be taken to find a nurse "of untainted Reputation, of unquestioned Virtue, and of a Mind as well formed as can be found" (315). The Courtier rather impatiently has the last word on this very early stage:

it may well be that a robust healthy nurse is better than a delicately-bred lady.

The arguments on both sides being fairly even on this matter, the group proceeds to discuss the next stage, the importance of which they are all agreed upon. As the Colonel puts it: "This is the Time when their Minds, and even their Nature is to be formed" (317). It is "a general and a fatal Mistake" to believe that children are incapable of learning, before "they can understand the Reason why any thing is good, or why the other is bad" (315). On the contrary, this is the very time to instil the good. This aspect of early training is rather "negative". Parents must ensure that a child learns no foul language, sees no wrong acts, and is never terrified by tales that engrave themselves on the infant imagination, for as the Country Gentleman says: "The Vices . . . brought with him out of the Nursery" (316) can never be eradicated. "To keep them from learning what is naught, is the greater Business than to teach them any Thing that is notable", confirms the Colonel (316).

On the positive side, such things as learning to dress neatly, deportment, elocution and articulation, the social graces generally, can all be acquired painlessly. This is the age when "the Tongue most delights in prating," when children love to play-act and imitate, so all this can "be taught and learned in Play and Sport, without restraining them from any of those Childishnesses which are natural to their Age" (317). Even foreign languages may be learned "by Rote, and without the Formality or Method of Grammar" (317). It is also important that children be taught "Gentleness, and Courtesy, and Affability towards all Men", while "all the Seeds of Pride, which will sprout up quickly, must be strictly watched, and all its Product extirpated", for pride is the cause "of all that Ignorance and Folly which usually disfigures the Lives of great Men" (317).

The Colonel believes that this play-learning stage should continue to age nine or ten. The Courtier immediately objects to the delay in introducing book learning. He knows boys who understand Latin and Greek well by that age. The Alderman, interested in long-term results, queries the effectiveness of this. "Did they understand proportionally afterwards, when they came to be Twenty?" he asks. "The Profit is not worth the Pains" (318). But the Colonel would "not restrain Children from learning as much as they have a mind to" (318). However, once the child is ready for serious study, he is definitely in favour of formal schooling taking place in a formal school setting. This is much to be preferred to the private tutor. The benefit derived from "the mutual Conversation of many Children together, of different Ages and different Parts, and the Imitation and Emulation that arises from thence" is not to be underestimated (318). Unfortunately the existing grammar schools fail in three ways, the Colonel claims. The children "spend too many Hours together at their Book," and too many hours on their own when they get into mischief, which leads to the third fault, "their staying too long in those Schools, even to the Age and Growth of Men" (319). When they do leave, they "carry all the Vices from School" with them (319). The Colonel would therefore like to impose arbitrarily a compulsory school-leaving age of sixteen, by which time any boy should be ready for the University, the

army or other course of life. The Bishop heartily agrees with this latter proposal, since he is convinced that the "Reproaches of Dissoluteness and Debauchery" that dishonour Oxford and Cambridge are largely brought about by "those over-grown Boys" (319).

The Lawyer is also in agreement, but he wonders how the Colonel proposes to remedy those faults in the schools. "Four to five Hours in the Morning, and as long in the Afternoon, without any Intermission", is "too long to be intent upon their Books", the Colonel declares (320). He suggests that two hours is long enough at any one time for instruction or imparting of information; the rest of the time ought to be given over to discussion, debate, acting, and other exercises such as riding, bowling and dancing. In his opinion the mind should be relaxed frequently with a "Succession of Exercises and Recreation" (320). In the ideal boarding school the master would be a well-bred foreigner, French or German, or a person who had travelled extensively. He would be a person of "unquestionable Integrity in Religion", but not one in "Holy Orders", lest he be diverted from his primary task, which is the "learning of Grammarians" (321). The master should also be married, so that his wife may be available to look after the welfare of the boys, who will be between the ages of nine and fourteen. The instructors of the "Exercises" are to be Frenchmen, since they teach "exercises" best. The all-inclusive fee would be 100 pounds per annum, and the enrollment thirty. The Colonel believes that if his ideal school could only be founded, catering as it would for "Persons of notable Parts and Sufficiencies" (321), similar schools would be established very rapidly throughout the land. And certainly, he thinks, if continual care were taken throughout the five-year course to instil the right notions of good behaviour, courtesy and manners, the average child would be ready (at age fourteen) to go on to university.

The old Country Gentleman questions at this point whether university is the best place for them next to go. He says that many "Great Men" are now refusing to send their sons there. The Courtier, who knows a great deal about this, relates three main complaints heard at Court about Oxford and Cambridge. The universities are places of debauchery, "Schools to learn to drink in, which is the Poison of good Education . . . the Learning they get there is impertinent, being only a pedantick way of Disputing and Wrangling"; the students' manners are appallingly rude, and the students themselves gauche in the company of ladies (322). The Courtier therefore feels that these universities might well be by-passed altogether, and the time devoted to travel, and to learning languages, exercises and behaviour abroad, especially in Paris. The Alderman, however, is scornful. Those who have spent a few years abroad often return impudent rather than confident: "all their Learning is in wearing their Clothes well; they have very much without their Heads, very little within" (322). In his opinion, travel should wait until after university; nor is he convinced that the universities have indeed altered so much from his day, when they were "places of great Sobriety" (323). The Lawyer strongly supports this view and claims to know the cause of the slander against Oxbridge: too many of the nobility, having no love of the ecclesiastical authority, merely pick a quarrel with the English universities as an excuse

for sending their sons abroad, which is not only subversive, but also prejudicial to their own interests in a peculiarly ironic way, since "the Nobility is there rooted out" (323). Nevertheless, the Lawyer concedes that it may be that "those lubberly Fellows, who come from great Schools after they are Nineteen or Twenty Years of Age" bring their licentiousness with them; and he invites the Bishop to give his opinion (323). The Bishop voices his concern about the prevalence of drinking throughout the country, but holds that there was never a time when care was more diligently taken by the university authorities "to propagate Learning and good Manners, and to suppress and discountenance all kind of Vice, and particularly that of Drinking" (324). To be on the safe side, however, he would favour the formation of a Royal Commission to visit the universities and investigate conditions, so that excesses might be discovered and corrected, and the cause of learning advanced. He is highly pleased that the Colonel should so insist on the worth of a university education, but hopes that he will not stop short at pointing out the defects in the universities "as may be remedied or supplied, to make them contribute to all the manly Parts of Education, as well as to Letters" (324).

The Colonel resumes with a vigorous defence of his native universities, which are less corrupt and dissolute than those in Holland, France and Italy that he knows well. While he firmly believes in the worth of university education, he points out that both the course and intent of the study must be orderly and serious. Where he finds the English universities defective is "in providing for those Exercises and Recreations, which are necessary even to nourish and cherish their Studies"; this disadvantage, he believes, may well contribute to the decisions of some to send their sons abroad (325). He would like to see Oxbridge give full scope to riding, dancing, and fencing, and particular hours assigned to those "exercises" as to their "studies". This would require the erection of an adequate building, the provision of a stable and riding-area, a stock of horses and a subsidy for a "yearly Pension" to several masters, whose maintenance could not be covered wholly by the proportionate fees paid by students according to their means (326). This subsidy might appropriately come from "the Royal Bounty," since the King would "receive some Recompence in the good Education of his Subjects . . . by which they would be much better prepared to serve him, and their Country" (326). As for studies, the Colonel strongly advocates the teaching of Logic and the practice of "Disputation"; nor would he permit the person of quality to choose whether he might attend "the Publick Scholastick Exercises of the House", which formerly was the case (326). The art of logic, learned largely through formal disputation, is invaluable, because it enables men "to discourse reasonably, and judge of the Discourses of other Men" (326). The Colonel could wish that Oxford and Cambridge would emphasise two things much more: "the Custom of speaking Latin in Conversation, and at Meals"; and "the publick Acting of Comedies and other Interludes in *English* as well as *Latin*", to promote confidence and grace in speech (327). If the students' time is well distributed "between their Study and their bodily exercises", and their conversation held with others "a little superior to themselves in Age and Parts," they may in three years have

read enough in "History, or any other Science their Genius shall dispose them to, as shall raise an Appetite in them to prosecute it in any Condition of Life they can betake themselves to" (327). University education might, then, conclude at the age of seventeen, when the student could well be sent to the Inns of Court for two or three years.

The Courtier is shocked by this last suggestion. Is all education, he asks, to end in the training of the nobility and gentry to be lawyers? He maintains also that the Colonel makes no distinction "between Elder and Younger Brothers, between the Heirs to great Fortunes, and those who must make their own" (327). The Alderman thinks the nobility and gentry could do worse than learn something of the laws and customs of the country, and better understand London, from a stay at the Inns of Court. But it is naturally left to the Lawyer to make the greatest defence of the Inns of Court. The great benefit of a stay at the Inns of Court is that of mixing with the flower of the country's gentlemen; no one who spends time there can fail "to know more of the Kingdom and the Government thereof" than he could otherwise (328-29). The Bishop is disposed to feel that there is considerable merit in associating with such a society as is found there, while the Country Gentleman has learned from observation that those who have the advantage of this experience are better able to manage their estates and the affairs of the country.

The Colonel now points out that when he suggested sending his students to the Inns of Court from university, he had not intended that they all become lawyers; two or three years there should rather furnish a maturation stage, when the student will finally decide for himself which course of life he is now to pursue. A stay there will provide the essential experience of living in London among good company, and what is learned of the law and of the proceedings of the Courts of Justice will fit him for any subsequent career. There he will practise dancing, riding, fencing, tennis; attend plays and participate in other recreations; make tours of the country and study the ways of life of the people; travel more extensively, be the better able to evaluate what is observed and so judge among nations. All this, conscientiously done at the Inns of Court, will make the student so accomplished that he will be bound to succeed whether he applies himself "to the Court, or to the Country, or to the Camp" (331). The Colonel then reverts to the Courtier's complaint that his scheme makes no distinction between Elder and Younger Brothers. That, says the Colonel, was intentional: he feels very strongly about the "ridiculous Preference and Precedence which is given to the First-born, who is taught to know before any Thing else, that he is an elder Brother; that is, that he will have Estate and Observance enough, how little Wit soever he attains to; let him be sure to be proud and ignorant, for he hath where withal to maintain both. Nature and the Law gives him Precedence, and a greater Share in the Inheritance, but that is no Release to the Father of any Part of his Duty in the Education" (331). The Colonel confesses himself quite out of patience with the prevailing situation, and wishes England would copy "that Country, to which we most resort to amend our Breeding", where the greatest care is taken for the education of the eldest son (332).

The Courtier asserts that he is now not only convinced, but converted to the view that a sojourn at the Inns of Court would be invaluable. The Bishop, however, at this point accuses the Colonel of a sin of omission: he has said nothing so far about religious instruction. The Colonel counters that in fact religious training has been implicit at every stage of his ideal educational process, particularly in the inculcation of "integrity of Manners" (333). Although opposed to the encouragement of religious disputation, and to "intoxicating the Heads of young People with the Fumes and dark Notions of Religion", he would like to see "a good Negative Catechism of Religion" taught to children "from their Cradle", so that they might know what to avoid; and this "should serve for their full Instruction till they are Men" (333). But the Bishop wants more than this. He would like the young to learn something of "the History of their own Church and Religion", so that when they travel, they might defeat the impudent Reproaches" of foreigners, who hold that "the Church of *England* hath no other Original or Foundation than the inordinate Lust of *Henry the Eighth*" (334). In addition, he would have them learn to pray, morning and evening, for God's guidance.

The Lawyer now focuses on the last stage of the Colonel's plan, which is travel, a most controversial issue of the day; he therefore raises the question of the real educational value of travel. The Courtier is quick to point out the great advantage the experienced traveller has at Court: travel teaches fluency in foreign tongues and is the making of ambassadors. The Country Gentleman at once pounces on this, and insists that the Courts of France and Spain do very well in matters diplomatic without learning English. Indeed, glibness in a foreign language is fraught with danger, since it may lead to serious oversights in the making of treaties with foreign powers. Not least, an eagerness to accommodate others in the learning of their tongue may appear an obsequious condescension. In the Alderman's opinion, however, "it is enough that able Men are made more able" by travel (338). The Bishop believes that practice in speaking a foreign language is a valuable benefit of travel, since "the Gift of Tongues" serves "for the Advancement and Propagation of Christianity"; it may also make the English less insular and enhance their general knowledge (338).

In reply, the Colonel concedes that some men undoubtedly learn nothing from travel: "Travel cannot make Men wise in spite of Nature" (339). Even proficiency in speaking foreign languages can be attained by study at home. But for the man of rank and means, who would be most likely to travel, that occupation can provide the greatest advantage in giving him access to foreign dignitaries. As the Colonel sees it, the two great ends of travel are the improvement of abilities and understanding through association with eminent people abroad, and the correction of manners, including national vices, by means of the example shown by those "better instructed and cultivated" (34). Accordingly, he recommends the Grand Tour as starting in France, proceeding to Italy, then Spain, and through France again (spending almost a year in Paris) to Belgium and Holland, returning thence to England. This educational progress should take no more than three years altogether.

The Alderman is critical of the suggested itinerary, holding that a visit to Germany would be of more lasting benefit than a journey to Spain. But the Colonel will have none of it: there is nothing good about Germany in his opinion, and "if they remain there one Year, they had need stay two in France afterwards, that they may entirely forget that they were ever in Germany" (343). Although the Country Gentleman is sceptical about the moral worth of travel, he is willing to admit that it can be beneficial to some.

The Country Gentleman, however, is more concerned about a matter that had been glossed over earlier: why does the Colonel in his ideal educational scheme give so central a place to the theatre?

The Colonel defends his position by holding that his system must take account of the youth's leisure; and when he brings him to London, which "is the great and publick Stage of the Kingdom", he ought to put the student in mind of the theatre. The theatre provides "the most innocent Mirth, Wit, and Instruction that ever was or can be made for the Delight of a Nation" (345). Just as he would advocate play-going as a pleasurable and profitable mental pastime to Londoners, so he would strongly support hunting and hawking for those in the country, such physical recreations "being manly Exercises, [which] keep the Body still vigorous and in health, and the Mind better disposed to honest and publick Thoughts" (346). The Country Gentleman is delighted to hear this expression of the Colonel's belief in *mens sana in corpore sano*. But he cannot forbear to rub in the superiority of the countrymen over the townsmen: "none of your Travellers ever keep us Company in our Field Sports; their Bones cannot bear leaping a Ditch, nor their Perriwigs a strong Wind; they are only for Chamber Exercises, and such Recreations as may not disorder their Hair or shake their Joints" (346).

The final word is left to the Bishop. Although he does not attend the play-house himself, he would not deny it to others. Like the Colonel, he acknowledges that "wise States" have always catered for the people's desire for such entertainment, and in his opinion the theatre is vindicated, because it provides the innocent refreshment of the human spirit. So long as the theatre is carefully regulated, he would be satisfied to leave it alone. Perhaps the custom of men acting as women ought to be changed and women allowed to play themselves, for no offence "hath been found when all Parts have been performed by the other Sex" (347). The Bishop then adds his thanks for the "excellent Conference" (348).

Relationship to Clarendon and the Educational Problems of his Time

Clarendon's tract, then, mirrors the diverse attitudes of the day towards certain aspects of education, the medium of dialogue lending itself to the voicing of several different sides of the issues involved. But throughout the *Dialogue* Clarendon's own educational ideals are clearly formulated, including his belief that the topic is of concern to all thinking men of his time. The fact that he wished to make education "an Argument apart" (315), when the subject had naturally grown out of the preceding *Dialogue of the Want of Respect due to Age*, is testimony enough to the importance he accorded to it. And since education and the Church were so closely

linked in men's minds, it seemed merely natural that a representative of the Church should be specially invited for this particular discussion. The men who meet together on this occasion, therefore, constitute a microcosm of upper society, the main groups to be found among educated Englishmen in the early seventeenth century: the Country, the City, the Court, the Law, the Army, and the Church. But typical as those *personae* are, together they embody a view that is essentially socially restrictive or selective. Yet Clarendon nowhere suggests that he is opposed to education of the lower classes; it is rather that he prefers to leave this for others to deal with, perhaps sensing the futility of attempting to treat education of the masses, when "good Education is chargeable" (313)—that is, expensive. No doubt, too, his exclusive interest in the nobility and the gentry, "the Children of Persons of Quality" (313), is a function of his background as a member of the Court circle.

As a courtier, Clarendon deplores the lack of grace, and the shallow, superficial learning that he meets at Court. It is to the lack of proper training during the early period that he attributes the dreadful *gaucherie*, unpleasant speech habits and inability to converse with ease that was evidently very prevalent in his time:

How few there are who make an Entry into a Room, where . . . if they find the Eyes of Men upon them . . . [they] put their Heads and Hands and Feet into Twenty Antick Motions . . . all which proceeds from their not being taught to walk and move in the Age we speak of [when] that natural Assurance which produces Steadiness and Comliness of Motion . . . [is] best received and fixed in us (317).

A properly planned education, he believes, will eliminate such awkwardnesses, in movement as well as in speech.

The background and loyalties of Clarendon are further exhibited in his adding a Bishop to the group. This not only indicates his belief that religion is an essential part of his scheme, but that religion to him means the Established Church, of which, as a Royalist, he was inevitably a staunch supporter. Both Clarendon and Milton were originally destined for the Church, but for widely differing reasons their courses were altered: Clarendon became an "Eldest Son", when his elder brothers died, thus making it unnecessary for him to continue his studies at Oxford. Milton, of course, felt a higher vocation. Moreover, Episcopacy was anathema to Milton: the only occasion he would have allowed a bishop to participate in a learned discussion would have been during a council in Hell!

The value to the author of his subsequent education as a lawyer is also clarified by the *Dialogue*. Doubtless this reflects a social phenomenon, which saw more of the nobility and gentry attending the Inns of Court than the Universities of Oxford and Cambridge combined:

At this period there were in practice not two but three universities in the kingdom. The third was the Inns of Court, whither increasing numbers of young noblemen and gentry resorted in order to study the law and at the same time pick up some of the airs and graces of the nearby Court. In the late sixteenth and early seventeenth centuries more nobles and landed gentlemen acquired a smattering of a legal education than at any time before or possibly since. Indeed although the popularity of both the universities

and the Inns of Court rose together, the Inns were at all times more frequented by the gentry than both the older universities put together. (Stone, p.690)

Nevertheless, one feels that the legal training acquired by Clarendon himself at the Middle Temple, with all its concomitant cultural activity, such as the theatre and travel, leads him to parade its merit. Similarly, his budding ability as a politician is related to other emphases in the *Dialogue*: the necessity for a basic understanding of the ways of government, and the advantage to be gained by exposure to foreign dignitaries and to the refinements of diplomacy. Hence the courtier, the Royalist, the lawyer and the politician all contribute to Clarendon's total concept and control its evolution.

The various occupations, loyalties and interests that make up Clarendon the man are paralleled by various aspects of his entire scheme of education, which is intended to produce the complete or finished scholar, as equipped in social graces as in formal learning. It is precisely because a well-rounded education requires a healthy body that Clarendon is careful to allot time to riding, dancing, fencing, and other physical activities. In this insistence on the education of the whole man, Clarendon, of course, gives voice to the ancient idea, first considered by Plato, Aristotle and Plutarch, and later developed by the early Humanists like Erasmus and Colet, who maintained that the training of the body should accompany the training of the mind. (Smith, p.403). Although this approach to education that Locke later described as "the sound mind in the sound body", was far from new, "the idea of all-round education for young men of birth became a popular and influential one" in England through the works of such men as Elyot, whose *Booke named the Governour*, published in 1531, also deals, like Clarendon's *Dialogue*, with the education of an elite. (Jarman, p.187). Indeed, there was a growing propensity, as Roger Ascham puts it, "to joyne learning with cumlie exercises". (Jarman, p.183). But the idea of "manly exercises" is also derived from the gallantry of the chivalric code, which was part of Clarendon's heritage, in so far as in Tudor England humanism and the old chivalric ideals met and blended.

It has been observed that after the 1530's there tended to develop in England two currents of thought on education. First, among the nobility there was propagated the extreme form of humanism castigated by Erasmus, that one learns purely for ornament or pleasure; the opinion that "too much learning lowers the dignity of rank" tended to prevail. (Simon, p.394). It is precisely this attitude that Clarendon strongly criticises (the Colonel says it quite "drives all Patience" [322] from him) in his insistence that the eldest son be educated at least as well as his younger brothers in order to manage faithfully his patrimony. But if "gentlemen were beginning to appreciate learning in relation to its uselessness, there were others to value it according to its use and the benefits it might bring". (Simon, p.397). This was the second stream of educational opinion: the application of knowledge to social and economic needs. Bacon revitalised the issue, though the point is sometimes overlooked that he did not thus dismiss valuable aspects of knowledge, which were not directly applicable to "useful" purposes. When, from 1640 on, Bacon's

ideas became readily available and were widely disseminated and discussed, this utilitarian view became more deeply entrenched. A study of his *Dialogue* makes plain that Clarendon was well aware of the urgent need to bend the education of the gentry towards this more practical goal. His views are consequently wholly in accord with the progressive educational thought of his day, representing as they do a serious attempt to discuss many of the contemporary social problems afflicting the aristocracy. For that virtue alone his *Dialogue concerning Education* can share a significant place with other educational treatises of the seventeenth century, and certainly ought not to be neglected any longer.

References

- Costello, William T. *The Scholastic Curriculum at Early Seventeenth-Century Cambridge*. Cambridge, Mass., 1958.
- Green, Wigfall A. *The Inns of Court and Early English Drama*. Rep. New York, 1965.
- Hardacre, P. H. "Clarendon and the University of Oxford, 1660-1667". *British Journal of Educational Studies*, 9. May, 1961, 117-31.
- Hill, Christopher. *Intellectual Origins of the English Revolution*. Oxford, 1965.
- Hyde, Edward, first Earl of Clarendon. *A Collection of Several Tracts*. London, 1727.
- Jarman, T. L. *Landmarks in the History of Education*. London, 2nd edn., 1963.
- Lister, Thomas H. *Life and Administration of Edward, first Earl of Clarendon*. 3 vols., London, 1838.
- Prynne, William. *Histrion-Mastix*. London, 1633.
- Simon, Joan. *Education and Society in Tudor England*. Cambridge, 1966.
- Smith, Constance I. "Some Ideas on Education before Locke", *Journal of the History of Ideas*, xxiii (3), July-Sept., 1962.
- Stone, Lawrence. *The Crisis of the Aristocracy, 1558-1641*. Oxford, 1965.
- Thirsk, Joan. "Younger Sons in the Seventeenth Century", *History*, LIV (182), October, 1969, 358-77.
- Thomson, E. N. S. *The Controversy between the Puritans and the Stage*. Rep. New York, 1966.

F. SUKDEO

An Assessment of Student Quotas and Fees In Alberta Universities

A cost-benefit analysis of the contribution made towards the education of foreign students at Albertan Universities and of their contribution to the economy is attempted. It is concluded that it would be premature to establish quotas or a differential fee system for foreign or out-of-province students until more satisfactory methods of classification of students is established. On the basis of available data, a strong prima facie case is made out that Alberta gains much more from such students than it contributes towards their education. (Dr. Sukdeo, formerly Research Officer, H.R.R.C., Alberta, is now in the Department of Economics, University of Guyana, Georgetown, Guyana.)

Introduction

In the context of the "brain drain", this paper examines the evidence and implications of restricting the enrolment of foreign and inter-provincial students at Alberta institutions of higher education. In some quarters it is argued that these students are a liability to Alberta tax-payers, that they account for a substantial proportion of education expenditure, and that they make little or no contribution to the economic growth or the welfare of Alberta society.

An increasing demand for high quality education at all levels is a post-war phenomenon with a direct effect on escalating educational costs. With expectations directed towards an ever higher standard of living, and with the population increasing rapidly through natural increase among Albertans, inter-provincial migration, and immigration, the demand seems to exceed the resources in terms of income and manpower. Faced with this situation, with a policy to curb inflation, with budgetary constraints, the provincial government is committed to restricting spending in several departments. Apparently education, one of the largest items of expenditure in the provincial budget, is considered to be well suited for such economies, especially at the university and college levels.

Definition of Non-Alberta Students

In order to analyze published data on students of non-Alberta origin, it is important to distinguish the categories under which students are classified and their limitations. There is no precise answer to the question what constitutes a foreign student or an "inter-provincial student" from another province. The Universities of Alberta, Calgary, and Lethbridge have different definitions for these categories, and even present their annual statistics differently.

The difficulty arises through the inconsistency of student interpretations of questions about their home address, province of origin, and country of citizenship. Home address is often given either as the present residential address or as the permanent address. Moreover, the three addresses are interchangeable, as students (or migrants in general) experience and expect physical, social, and economic mobility. A student from Manitoba, after a year in Edmonton, aware of a favorable demand for his skill after graduating, is likely to consider his Alberta address to be his home address.

Even if students in their first year define home address as their parents' address, or the address which indicates the last school they attended, the majority can only temporarily be classified as "belonging" to a given province. A better index to determine origin of inter-provincial students is the province of first permanent employment after graduation.

One would expect that all students on student visas would give as their "home or permanent address" an address in their country of origin. But this is not entirely borne out by the statistics in the Annual Reports of the Universities. For example, in 1969-70, at The University of Alberta, there were 125 students who gave the United States as their home address. In the same year, there were 137 Americans on student visas. Thus, at least 12 Americans on student visas gave a Canadian address as their permanent home. This number is probably an under-estimate if one takes into account students on immigrant visas who give a United States address as their permanent home. This pattern is repeated for other nationalities.

One has to be aware that students are one of the most mobile sections of the population, tending to move to locations with attractive and expanding job opportunities. Considering the "brain drain" of teachers, doctors, and other professionals to Alberta, it seems rational to hypothesize that a large proportion (perhaps an overwhelming majority) of "inter-provincial" students remain in Alberta. If this is so, then their selection of Alberta as a home address is compatible with the reality of their life-expectations. Even those who consistently give a non-Alberta home address do not always constitute a large proportion, especially of teachers who seek employment opportunities in this province at the end of their university education. Consequently, much of the concern about the increasing enrolment of "inter-provincial" students seems misplaced: and to imply that other provinces are indirectly receiving "financial aid" from Alberta which enrolls large numbers of their students is irrational.

According to recent statistics released by the Alberta Teachers' Association, the supply of school teachers exceeds the demand. According to the report on "The Market Demand for Teachers in Alberta," (Shapiro,

1971) the end of the shortage of teachers is concomitant with the levelling-off of enrollments in school, together with the increasing output of trained teachers from Alberta universities.

The category of "foreign student" is even more complex. They hold either "landed immigrant" status or student visas. Students are clearly defined in their first year. However, it is the practice amongst the majority of graduate students during their first year, and of undergraduates in their second or final year, to change their status from "student" to "landed immigrant". In the average year, according to data and information acquired in the last few years, about 40 percent of all foreign-born students graduate from Alberta universities with the legal status of "landed immigrant". By definition, such students have indicated their intention of remaining permanently in Canada.

It is most likely that the majority of these students remain in Alberta. Assuming that they do, provincial expenditure on their education is not a loss but an investment for the development of the province. Considering these changes to immigrant status and the return rate amongst foreign-born students, the net population of genuine foreign students (those who eventually return to their country of origin) would be significantly smaller than the figures which appear in the Annual Reports of the Universities.

The low return rate of foreign students to their countries of origin is explained in terms of socio-economic mobility: there exist compelling factors which attract people to a society where output can be maximized with the highest possible economic and social rewards. The majority of such students pay their own way through the university system after their first year and, like other students, they are indebted to financial institutions on graduation. The immediate solution is to pay off these debts and acquire capital with which to return home, or to pursue the materialistic life of Canada. The realization of either of these goals takes a number of years: it is suggested that during this period the tax payers of the province are indirectly repaid for financing the education of these students.

Foreign students have been singled out by proponents of higher and differential fees: this is based on the opinion that the majority of foreign students are wealthy and can easily afford to pay increased fees. Additionally, it is believed that increases in tuition fees with certain conditions of enrollment, would encourage these students to return to their countries of origin. Such trained manpower would be an asset to the socio-economic development of less developed countries.

The principal argument against "inter-provincial" students is that Alberta students are discriminated against in other provinces by subtle and concealed admission quotas, and that there are fewer Albertans studying in other provinces than there are students from these provinces in Alberta. The proposed restrictions, limitations, and differentiation in tuition fees is speculative, being based on imaginary situations, with no adequate systematic analysis of the available data. Indeed, at the time of writing, there is no published document which provides more than simplistic statements and resolutions. One is inclined to interpret the sentiments expressed in these statements as provincial chauvinism alien to the philosophy of Confederation, and the democratization and universality of education.

Growth in Enrollment and Per Capita Cost

To examine the dimensions of the financial situation and its relevance to the “brain drain” issue, let us review the growth of the university system during the period from the 1958-59 to 1969-70. During this decade, full-time students increased 4.4 times, from 6,021 to 26,599, while part-time students increased 3.3 times, from 4,128 to 13,706. (See Table 1.)

The most remarkable feature of university growth in Alberta is the accelerated increase in the student population during the last five years. In the academic year 1969-70, the total number of full-time students was 15.7 percent greater than in the previous year. Each of the three universities experienced rapid growth, especially The University of Calgary, which enrolled one-third more than in the previous year. However, in the following academic year, the total full-time increase for all three universities was only 2,414 students. This represents a growth of only 9.1 percent over the previous year.

TABLE 1
OPERATIONAL DATA ON THE ALBERTA UNIVERSITY SYSTEM
1959 TO 1970

Academic Year	Full-Time Students	Part-Time Students	Sources of Operating Income (\$000)				Net Operating Expenditure Per Full-Time Student
			Fees	Provincial Grant	Federal Grant	Other Revenues ²	
1959-60	6,021	4,128	1,772	3,947	1,818	18	1,275
1960-61	7,150	4,598	2,049	6,000	1,876	22	1,375
1961-62	8,251	5,808	2,796	8,000	1,947	25	1,535
1962-63	9,149	6,165	3,082	9,542	2,682	35	1,650
1963-64	10,293	7,134	4,016	11,053	2,716	50	1,742
1964-65	11,921	8,350	4,816	15,260	2,750	50	1,867
1965-66	13,542	8,612	5,613	18,644	2,748	244	2,099
1966-67	15,597	9,647	6,394	25,275	6,769	379	2,434
1967-68	18,645	9,893	7,353	43,019	182	1,029	2,759
1968-69	22,976	11,868	11,387	55,859	203	1,631	2,800
1969-70	26,599	13,706	13,248	66,339	144	2,188	3,098
Increase 1958-59 to 1969-70 (times)	4.4	3.3	7.5	16.8	—	—	2.4

¹ Beginning in 1967-68, the Federal Government stopped its direct payments to the Universities (except for small amounts for Vocational Education and Social Welfare) and reimbursed the province for 50 percent of the cost of approved expenditures for post-secondary education.

² Beginning in 1965-66 interest was shown as an income item. Prior to that, it had been netted out of the administrative department expense, i.e., the interest earned was used to reduce expenditures rather than as income. This change in accounting explains the jump in other income between 1964-65 and 1965-66. The interest earned figures, in thousands of dollars, for 1958-59 through 1964-65 were: 1959-59, 2; 1959-60, 11; 1960-61, 11; 1961-62, 27; 1963-64, 87; and 1964-65, 158.

Source: *Annual Report of the Alberta Universities Commission, 1969-70*, page 16.

According to preliminary figures for the 1971-72 academic year, it is estimated that there was no increase in student enrolment in the Alberta university system.

On the expenditure side, provincial grants to the university system increased by 16.8 times—from \$3.9 million to \$66.3 million between 1959-60 and 1969-70. Fees from students, on the other hand, increased 7.5 times during this eleven-year period. However, during this period, the net per capita operating expenditure per full-time student, which is often used as an index to indicate escalating costs, increased by 2.4 times—from \$1,275 in 1959-60 to \$3,098 in 1969-70. However, taking account of inflation, the real per capita operating expenditure, in terms of the 1959 dollar, would appreciably reduce the increase.

It is necessary to point out that the federal government makes a tangible contribution towards post-secondary education. As a result of the recent 50 percent formula for defraying post-secondary education costs from federal resources, Alberta received \$16 million in 1967-68: this was increased to \$34 million in 1968-69. The largest proportion of this grant is channelled to the university and college system.

Origin of Canadian Students in Alberta Universities

Of much concern to policy-makers and administrators is the growth in absolute numbers of non-Alberta students. It is evident that there is an influx of out-of-province students to Alberta universities. However, the percentage of non-resident students in relation to total enrolment has not increased, but has actually decreased. Furthermore, little attention has been given to the large numbers of Alberta students enrolled in higher education programs outside of Alberta.

Students in Alberta universities from other parts of Canada increased by 70 percent, from 1,023 in 1967-68 to 1,776 in 1970-71. Approximately three-quarters of these students are from Western Canada. In 1970-71, the largest group (33.1 percent) were from Saskatchewan, followed by 23 percent from British Columbia, 18.8 percent from Ontario, and 6.4 percent from Manitoba (see Table 2). However, this absolute increase changed only marginally the proportion of students from other provinces studying in Alberta. In 1970-71, 6.1 percent of the entire full-time student population on the basis of home address were from other provinces.

Compared to other provinces, Alberta (with 6.1%) does not rank very highly in the proportion of out-of-province students enrolled in university education. In 1969-70, Manitoba and Ontario had 8.7 and 8.6 percent respectively, while Nova Scotia and New Brunswick had 25 percent of out-of-province students (there is a special co-operative arrangement among the Atlantic Provinces). The largest inflow of students to Alberta is from Saskatchewan, followed by British Columbia and Ontario.

Alberta Students in Other Provinces

A remarkable feature of the inter-provincial flow of students is the increasing number of Albertans going to other provinces. In 1969-70, there were 1,818 Albertans studying elsewhere in Canada. This represents increase of 15 percent over the previous year. The largest flow of students

from Alberta is to British Columbia and Ontario. Each of these provinces accounts for about one-third of the outflow of Alberta students.

TABLE 2
DISTRIBUTION OF FULL-TIME INTRAMURAL STUDENTS
IN ALBERTA UNIVERSITIES—1967-71

Province	1967-68		1968-69		1969-70		1970-71	
	No.	%	No.	%	No.	%	No.	%
Newfoundland	12	1.2	14	1.1	11	0.7	17	1.0
Nova Scotia	20	2.0	34	2.9	52	3.4	56	3.2
Prince Edward Island	9	0.9	5	0.4	11	0.7	18	1.0
New Brunswick	10	1.0	12	1.0	16	1.0	25	1.4
Quebec	51	5.0	68	5.6	86	5.6	123	6.9
Ontario	163	15.9	224	18.4	280	18.3	334	18.8
Manitoba	69	6.7	86	7.1	113	7.4	114	6.4
Saskatchewan	359	35.1	419	34.4	532	34.3	593	33.1
British Columbia	264	25.8	298	24.4	361	23.6	409	23.0
Yukon and N.W.T.	56	5.5	58	4.8	61	4.0	87	4.9
TOTAL OTHER PROVINCES	1,023	100.0	1,219	100.0	1,527	100.0	1,776	100.0
Alberta	16,129	—	19,688	—	22,582	—	25,996	—
Total students at Alberta universities	18,645		22,976		26,637		28,991	
Percentage of students from other provinces		5.5		5.3		5.7		6.1

Source: Annual reports of The Universities of Alberta, Calgary and Lethbridge, as submitted to the Alberta Universities Commission.

Since it could be argued that the figures for one year conceal trends, the following table is presented to indicate the net flow of students to and from Alberta over the last decade. According to Table 3, in 1960-61 there were 322 more Alberta students in higher education in other provinces than students from other provinces in Alberta. In 1967-68, this figure increased to 712: it declined after that year. During the decade, the total gain to Alberta was 4,021 students. All provinces except Saskatchewan and the Atlantic Provinces educate more Alberta students than Alberta educates their students: this represent a net loss to their resources. What, then, is the rationale in restricting the enrolment of inter-provincial students in Alberta universities when other provinces are indirectly financing the education of a relatively large proportion of Alberta students?

Thus, the concept of imposing quotas on inter-provincial students cannot be justified on economic grounds, except, perhaps, in the case of students from Saskatchewan. Nor is there any tangible justification for devising differential tuition fees to approximate the real cost of education in the province. After consulting all available sources of information for differential tuition fees at universities in Canada, it has been found that only the University of Windsor in Ontario has such a scale. The differential amounts to only \$100 and applies only to graduate students from outside the Province. If Alberta were to pursue a differential tuition fee policy for Canadians, it is possible that other provinces would follow. The outcome of this development would be a financial loss to Alberta.

TABLE 3
NET FLOW OF INTERPROVINCIAL UNIVERSITY ENROLMENTS
FOR ALBERTA 1960-61 TO 1969-70 BY PROVINCES

	British Columbia	Saskat- chewan	Manitoba	Quebec	Ontario	Atlantic Provinces	TOTAL
1960-61	-162	+156	- 58	-226	- 44	+ 12	322
1961-62	-196	+111	- 83	-233	- 87	+ 4	-484
1962-63	-176	+153	-122	-220	- 96	+ 8	-443
1963-64	-173	+200	-100	-260	-103	+ 18	-418
1964-65	-152	+252	- 81	-277	- 89	+ 6	-341
1965-66	-297	+191	-110	-285	- 92	+ 14	-597
1966-67	-287	+250	- 84	-242	-109	+ 19	-453
1967-68	-475	+203	- 77	-271	-102	+ 10	-712
1968-69	-313	+328	- 35	-198	- 65	+ 23	-260
1969-70	-159	+433	- 36	-284	- 12	+ 49	- 9
TOTAL NET	-2,390	+2,227	-776	-2,496	-799	+163	-4,021

Note: A minus sign indicates that fewer students from that province were enrolled at Alberta universities than students from Alberta were enrolled in the universities of that province: a plus sign implies the converse.

Source: Dominion Bureau of Statistics 81-204 (*Survey of Higher Education*, Part 1, 1968-69), Table 8.

Foreign-born Students in Alberta Universities

Let us examine the situation in relation to foreign students. The statistics on these students and on Canadians in foreign countries are inadequate and subject to a large range of error. Canada for many years has been providing higher education for students from many countries. Recently, the base has been broadened to include many students from less developed countries. Altogether, in 1940-41, 5.7 percent of the total enrolment came from outside Canada. The proportion increased only to 6.5 percent in 1968-69, although the actual number increased from 2,056 to 17,423 during this period. However, full-time enrolment in universities in Canada increased even faster, from 36,919 to 270,093, during the 28 years (Dominion Bureau of Statistics).

Among the major universities in Canada, Alberta has the smallest percentage enrolment of foreign students. The universities of McGill and

Toronto registered 15.6 percent and 10.2 percent in 1967-68, respectively, compared to 4.4 percent at The University of Alberta.

The size of the total foreign student population in Alberta universities has been increasing continuously, although the proportion of foreign students in the total student body increased only marginally. In 1967-68, the proportion of full-time students from foreign countries represented 4.2 percent of all students. In 1968-69, this proportion increased to 6.5 percent, but declined in the next academic year to 4.7 percent. The total number of full-time intramural students by country of citizenship in 1970-71 was 3,433 persons. Of these, the largest proportion—20.3 percent—were from the United Kingdom, followed by the United States—19.2 percent, Hong Kong—12.3 percent, India—5.9 percent and, the Caribbean—4.9 percent.

The majority of students are from Anglo-Saxon countries, while only a small proportion are from less developed countries. Taking this situation into consideration, it would seem inappropriate to set quotas for countries, the majority of which have fewer than five students in Alberta. The rising number of students from Hong Kong is of special interest, considering the population of that country. In 1967-68, there were 92 students from Hong Kong, whereas in 1970-71 the number had increased almost by five times to 422, an increase of 84 percent over the previous year. It should be pointed out that students from other areas increased appreciably. For example, from the United States and Thailand, the increase was of the order of 26 percent and 48 percent respectively. On the other hand, students from large, colored Commonwealth countries substantially declined by 18 percent. There was only a marginal increase for students from the United Kingdom.

Limitations of a Quota System

Even if a policy of student quotas were to be implemented, there is no evidence that the total intake of foreign students can be significantly reduced. The main factor is the impact of the immigration laws of Canada, over which provincial governments have no jurisdiction. In addition, the flow of foreign students is dependent on Canada's foreign policy in relation to less developed countries. A large proportion of students from colored Commonwealth countries received federal government scholarships to pursue higher education in Canada as part of its foreign aid program. For example, as a result of a change in policy, students from India declined from 220 in 1969-70 to 203 in the academic year 1970-71.

Foreign students in Alberta universities are classified into those holding student visas, and those who are "landed immigrants". The latter status provides the student with many rights and privileges, including the right to work, to be entitled to a grant after one year's residence on the same terms as other Canadian students, and the right to education. Can a foreign student, immediately after arrival in Alberta or after one year of living in this country, be denied university admittance. Under the existing entrance requirements refusal can only be on the ground of academic inadequacy.

The statistical evidence indicates that 37.4 percent of all foreign students hold student visas. However, it must be recognized that the less highly developed countries have each a high proportion of such students. For example, in 1969-70, all the students from Thailand were on student visas, while the proportion from Ghana was 94.1 percent, from Malaysia 92.7 percent, from Hong Kong 79.9 percent, from Pakistan 70.0 percent and from India 60.9 percent.

The reverse is true for the Anglo-Saxon developed nations. From the United States and Great Britain, the proportions are 32.2 percent and 12.8 percent, respectively. These two countries provide about 45 percent of the total of students in both categories. Very few students would be denied university entrance if considered from the standpoint of having landed immigrant status. One does not know how long after their arrival in Canada these and other European landed immigrants have taken to enter the university system. It is probable that many of these students came to Alberta planning on permanent residence, and that they have been wage-earners from one to five years before they became students.

Inflow of Professional and Skilled Manpower

Policies directed towards differentials relating to fees, quotas, and regional distribution in the enrolment of foreign and inter-provincial students at Alberta universities should take into consideration the "brain drain" flow to Alberta. It is argued that the absolute total subsidy by the Province of Alberta of operating costs for foreign students increased from \$1.5 million in 1968-69 to \$1.6 million in 1969-70. This is calculated as half of the per student cost of \$1,170 and \$1,298 in 1968-69 and 1969-70 respectively. The federal government pays half of the operating costs of university education. On the same basis the total cost for "inter-provincial" students was \$1.6 million and \$2 million in 1968-69 and 1969-70 respectively. While foreign students and those from other parts of Canada have received a subsidy on the average of about \$4,000 for a degree from Alberta universities, the Province of Alberta has been the beneficiary of the influx of thousands of professionals each year from international sources as well as from other provinces. This flow of highly qualified human resources has ensured, and accelerated, the social and economic development of this province, without any direct contribution by Alberta taxpayers towards their education.

The magnitude of the brain drain to this province is enormous (Johnson, 1965). For example, in 1969, immigrants with professional qualifications whose intended destination was Alberta totalled 2,286 persons. Of these, 83 were physicians and surgeons, nearly the same number of graduates that year from the Faculty of Medicine at the University of Alberta (Annual Report, 1970). In many previous years, immigrant physicians and surgeons exceeded the output from The University of Alberta.

The contribution of this element of the brain drain is even more significant when one considers that of 240 new doctors registered in Alberta in 1970, only 64 (25 percent) were trained in Alberta. Of the remainder, the bulk was from Great Britain, and 40 persons from other Canadian schools. Altogether, only one-third of the 2,068 practicing physicians were Albertans.

The proportion of non-Albertan teachers in the province is also remarkable. In 1969, of 18,011 teachers, 67.1 percent received their earliest certification from Alberta, while 21.9 percent were from other provinces, including 13.9 percent from Saskatchewan.

The average cost of the university education of a medical general practitioner is about \$45,000; in 1970, non-Albertan doctors, in terms of direct university costs, represented a total of approximately \$8 million in human capital inflow, of which \$6.1 million was from foreign countries. This sum can be compared to the estimate of \$1.6 million which the Province of Alberta spent in 1969-70 to subsidize the education of all foreign students (by home address) in universities. Moreover, when this subsidy is considered against the total human capital inflow of the 2,286 professionals in Alberta in 1969, it represents only an insignificant indirect financial contribution to the students' countries of origin.

Summary

There is little economic justification for placing quotas on students from other countries and provinces without further research on the universal and national contexts in which education takes place, and the needs of Alberta and other provinces and countries. During the last decade other provinces and countries have provided higher education for more Albertan students than this province has enrolled. There are also considerable numbers of Alberta students receiving their education in other provinces and countries.

Before the situation in Alberta can be properly analyzed, more satisfactory methods are needed to establish the exact number of students, and the differences in their status, from foreign countries and from other provinces in Alberta.

References

- Adams, Walter, *The Brain Drain*. New York, The Macmillan Company, 1968.
- Alberta Universities Commission, *Annual Report, 1970-71*, Edmonton, Queen's Printer, 1971.
- Barkin, S. The economic cost and benefits and human gains and disadvantages of international migration, *Journal of Human Resources*, 2 (4): Fall, 1967.
- Canada: Department of Manpower and Immigration, *New University Graduates, Supply and Demand, 1969-70*, Ottawa, Queen's Printer, 1970.
- Canada: Department of Manpower and Immigration, *Immigration Statistics 1969*, Ottawa, Queen's Printer, 1970.
- Canada: Dominion Bureau of Statistics, *Survey of Higher Education, Part II, 1968-69*. Ottawa, Queen's Printer, 1970.
- Committee on Educational Interchange Policy, *The Foreign Student: Exchange or Immigrant?* New York, 1958.
- Institute of International Education, Inc., *Open Doors: Report on International Exchange*, New York, 1970.
- Johnson, Harry G., "The Economics of the 'Brain Drain': The Canadian Case". *Minerva*, Spring, 1965; pp. 299-311.
- Johnson, Harry G., Some economic aspects of brain drain, *Pakistan Development Review* (Karachi) 7 (3): Autumn, 1967.

- Kumar, Ramesh, "Our Brain Drain", *Seminar*, New Delhi, April, 1967.
- Perkins, James. "Foreign Aid and the Brain Drain", *Foreign Affairs*, Vol. 44 (July, 1966).
- Shapiro, D. *Preliminary Report on the Market Demand for Teachers in Alberta*, Human Resources Research Council, 1971.
- Thomas, Brinley, "The International Circulation of Human Capital". *Minerva*, Vol. V, No. 4, Summer, 1967.
- Universities of Alberta, Calgary and Lethbridge, *Annual Reports*, 1967-71 (as submitted to the Alberta Universities Commission).

Special Review

by John McLeish

Oscar Krisen Buros (ed). *The Seventh Mental Measurements Yearbook*, The Gryphon Press, Highland Park, N.J. 1972, 2 vols. pp. xl + 1986. \$55.

What can one say about the Seventh Mental Measurements Yearbook adequately to convey the quality of the work? For a start, it appears to be twice as large as we are accustomed to see Buros. On inspection, it has all the qualities of the earlier yearbooks. Apparently it must be twice as good. Clearly, this is impossible! But it is still a quite remarkable achievement. Indeed it is extraordinary, in the class of a miracle that is always with us, that this two-"man" team, Oscar and Luella, with an associated small group of dedicated workers, have now spent over 34 years producing the "Yearbooks" as the most indispensable reference book in their field. The present volume is the crowning-piece of their achievement: it now seems very doubtful that another yearbook will appear under their imprint.

These two volumes are a fitting continuation of the work begun three or more decades ago. More than 500 tests are reviewed by nearly 800 independent experts. These provide essential information about validity, reliability, norms and sources of tests as well as informed and frank comment about them. The new edition of the Yearbook, the first since 1965, concentrates on *new* tests, but several reviews of older, standard tests are up-dated. The established tradition of republishing reviews of books on psychometrics from the professional journals is continued.

The seven Yearbooks together, all of which are in print, provide the most comprehensive coverage of this area that one could possibly ask for. It is very helpful that the same format, the same layout, the same print, is used in this as in the earlier volumes. The valuable introduction provides a detailed breakdown of the volume itself which (fortunately) excuses the reviewer from making any attempt at a detailed analysis of the contents of this monumental work. It is indeed encyclopedic in its range. The maintenance of the critical and independent standpoint of the enterprise is shown by the editor's rather casual remark (which however is clearly a considered judgment with which many of us would agree) that "at least half the tests currently on the market should never have been produced". That the proportion is not considerably higher than half is surely to be placed to the credit of the present series and their collaborating reviewers.

The reviews of books in the field of measurement, which take up roughly a quarter of the space available, maintain the established tradition of frank, disinterested comment, presenting a number of independent standpoints by leading experts. Unlike the test reviews, which are specially commissioned for the Yearbook, the book reviews are republished from the academic journals. It is interesting in reading the reviews of the previous Yearbook, included (as usual) in the current volume, to discover that all

the favourable things that one wishes to say about the present revision have already been said about its predecessor—"unique", "monumental", "indispensable", "unbelievable", "needing only a few Gustave Doré prints to heighten the illusion of a 'Bible'" etc. The niggling complaints which are generated in the casual user who fails to appreciate the nature of the work, have all been voiced before too—price, weight, an irritating and frustrating method of pagination and indexing, discursive and discordant opinions etc., etc. For those of us who use tests continually however, and who really want to know about them, it must be said that the new Seventh Yearbook has an exceptional value and will be blessed daily by students, librarians and research workers. It is beautifully bound in a sumptuous style, is printed in large, readable type, it contains exactly the kind of basic information about new and revised tests we need and it contains a fair sampling of the opinions of those leading experts who have actually used the tests they are reviewing. In a word, it is exactly the book we have been waiting for since 1965.

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FACULTY OF EDUCATION
The University of Alberta

GEORGE R. GOODLET

*Kent County Board of Education
Chatham, Ontario*

Nongrading and Achievement: A Review

A review of research on nongrading and achievement suggests that the case for nongrading is not yet established and, because of methodological problems in many studies, may not have been adequately tested.

The last ten years have seen an increasing interest among educators in the possibility of moving away from the grade as the basis of elementary education. While several methods of nongrading have been proposed, the most common appears to be the organization of some areas of the curriculum into levels or units (Goodlad & Anderson, 1962). Generally the work to be covered is specified in considerable detail, with two or three levels corresponding to the work which would previously have been covered in one grade. As a child completes one level he moves on to the next so that children in any one grade may be at several different levels. Grade numbers are used but do not necessarily indicate the level at which a child is working. Promotion takes place when the child is ready, at any time of the year and is not limited to the traditional times. In the next "grade" he takes up his work at the point at which he left off at the end of the year.

However, despite the popularity of this particular approach to nongrading, it is possible to feel some doubts about the validity of the research on which are based some of the assumptions about the efficacy of this approach. Some of the research is reviewed below.

Experimental work in this area suffers from two difficulties which may confound the results obtained. The first relates to the comparability of schools when nongraded schools are compared with graded. If the schools are really different, with the graded school treating classes as units and the nongraded school somehow avoiding this, a clearly pertinent question is: Why are the schools different? It is possible that they differ because the teachers differ or because one set of parents demands a par-

ticular approach or because any one of a number of factors is at work. Thus, if the teachers differ, one group of children might be superior in any form of organization.

The second problem is the obverse of the first and relates to the differentiation between two schools. It can be too readily assumed, because a school says it is nongraded, that it is, in fact, nongraded. A different name may disguise the same structure. Similarly, it may be too readily assumed that a graded school is much more rigid than it is in fact. A graded and a nongraded school may well share a similar philosophy and differ only slightly in practice. A discussion of some of the problems found in research in this area can be found in Douglass (1967).

Anderson & Goodlad (1962), on the basis of a survey of school systems, reported on the views of those who have undertaken some measure of nongrading. There is no doubt that those who responded to the survey considered that the change had been beneficial, affecting discipline, achievement, and pupil adjustment. Unfortunately, few objective evaluations appear to have been made by the school systems at that time. Certainly, many systems reported that fewer children required an extra year in Grades 1 to 3 than formerly. However, as the authors point out, this is difficult to interpret since their respondents did not indicate the level of achievement of the children at the end of what would normally be Grade 3.

It does appear from this report that nongrading meets with the approval of parents. This in itself might be an important factor in any measureable change in pupil characteristics.

The experimental results from comparisons of grading and nongrading practices are equivocal and the problems mentioned earlier should be borne in mind.

Skapski (1960) studied second and third grade children in a school in which the reading program was ungraded while that for the other subjects was "carried on under the traditional graded system." A comparison of the level of achievement on the Stanford Achievement Test in paragraph meaning and arithmetic computation revealed that the grade-equivalent scores for arithmetic were considerably lower in both grades than those for reading. This difference was attributed to differences in the type of instruction. However, testing in other schools in which nongrading was not used for reading revealed similar discrepancies between reading and arithmetic grade-equivalent scores. This suggests that Skapski's conclusion is not proven.

A further problem of interpretation in this study relates to a general difficulty in the use of standardized tests where grade norms are available. It is known that such tests are often standardized at one or two points in the year and the norms for other points are derived by extrapolation. The assumption is made that "growth" in a subject takes place in a uniform manner. That this is not so has been shown by Bernard (1964, 1966). It follows that, unless the test is used at the time of year when it was standardized, discrepancies may occur between predicted and actual achievement. While this could not account for all the discrepancy

found by Skapski, it is conceivable that using the arithmetic test at another time might have reduced the differences found.

Another explanation is, of course, that, for some reason, the published norms for the arithmetic test may not have been applicable to the population studied by Skapski.

In a comparison of arithmetic achievement, based on the Arithmetic Battery of the California Achievement Test, of fourth grade children from a graded and a nongraded school, Hart (1962) found a significant difference in favour of the nongraded children. Although Hart considered that "instructional methods and materials utilized for both groups were similar," he also indicates that the staff in the nongraded school developed their own "systematic arithmetic program, independent of any given textbook series." There is no evidence that such a program was in use in the graded school. The conclusion that *nongrading* is effective in raising arithmetic achievement is rather naive.

To some extent the problem of comparability of schools was overcome by Buffie (1962) who used four schools from each of two school systems. The schools were equated on socioeconomic level, enrolment, class size and training and experience of teachers. Children from the school system having nongraded schools were significantly superior in language and work-study skills and in adjustment.

Halliwell (1963) was able to compare children who had experienced a graded system with children in the same school who began school one year later than the former group when the nongraded program was inaugurated. Measures of achievement were made in Grades 1, 2, and 3. Reading was taught on a nongraded basis in Grade 1, spelling only in Grades 2 and 3.

In Grade 1, nongraded pupils had significantly higher achievement scores in word knowledge and reading comprehension. In Grades 2 and 3 significant differences were found for arithmetic (computation and problem solving) which was not taught on a nongraded basis, but not for reading. While the teachers of pupils nongraded in reading seem to have been able to spend more time on arithmetic, the conclusion that arithmetic is improved can only be cautiously accepted at the present time.

Hillson, Jones, Moore, & Van Devender (1964) have reported the only study located which employed random assignment of subjects to a nongraded or graded program. Unfortunately, since only one school was used, numbers are rather small and it is not clear to what extent the original samples were subject to the attrition during the period of the study. Teachers were also randomly allocated after selection on the basis of teaching ability.

In the nongraded group, nine reading levels were set up for Grades 1 to 3. In the graded group, three reading groups were used within each class.

At the end of the third semester the nongraded group was significantly superior on the Lee-Clark Reading Test and also on a word meaning test. This group was also superior, though not significantly, on paragraph meaning.

In view of the design used in this study it seems likely that confidence can be placed in the results obtained.

In contrast to the previous study, Williams (1966) failed to show that the schools involved were strictly comparable. A matching procedure was used to obtain groups comparable in age, sex, and I.Q. Little confidence can be placed in this matching since "boys were not always matched with boys, or girls with girls, but about the same number of boys and girls were selected from each school." Six achievement measures were taken with the nongraded children having significantly higher scores on paragraph meaning. No significant superiority was found on arithmetic concepts or computation, work-study skills or word meaning. The graded group was higher only on spelling. Because of the poor design and bizarre matching procedure, little confidence can be placed in this result.

Jones, Moore & Van Devender (1967) reassessed the groups used by Hillson, *et al.* (1964) after three years in the program. The same measures were used. No significant differences were found on paragraph meaning or word meaning. However, the sizes of the groups had altered from 26 in each group to 27 in the nongraded program and 22 in the graded program.

Morris (1968) was able to compare children who had experienced a graded system with those starting school one year later when a nongraded program was begun. At the end of Grade 3 those in the nongraded program were significantly higher in achievement on the Iowa Test of Basic Skills when intelligence was controlled. This applied for both sexes. This difference was maintained in Grades 4 and 5 where the instruction was similar for both groups.

Brody (1970) compared children from nongraded and graded schools in the same school system. Since the mean intelligence score was higher in the nongraded schools, matched samples were used. In Grade 1 nongraded children were significantly superior in spelling, arithmetic reasoning and arithmetic computation. In Grade 2, significant differences were found in word meaning and the arithmetic measures.

No indication is given in this study of the reasons why some schools were graded and others nongraded within the same system. Without such knowledge it is difficult to assess the results.

The studies reviewed above have generally found at least some difference in achievement in favour of nongraded schools, although the evidence is not always convincing. The studies to be considered below have not found such differences. It should be noted, however, that the defects of design and control observed in the studies reviewed above are to be found also in the studies which do not find differences in favour of nongrading.

The problems which can be encountered in studies of this type are well illustrated in Carbone's (1961) paper. Children in Grades 4, 5, and 6 from a graded and a nongraded system were compared on achievement and "mental health." Matching was done for age and sex. Results obtained show that children from the graded system had significantly higher scores on vocabulary, reading vocabulary, reading comprehension,

language, work-study skills, and arithmetic. On the measures of mental health, only the scores for social participation were significantly different, again in favour of the graded group.

However, confidence in this result is diminished by the results of Carbone's survey of teaching practices. Only 30 per cent of teachers in the nongraded, and 24 per cent of teachers in the graded, system responded to a questionnaire on their teaching practices. These responses revealed that "teachers in the nongraded schools appeared to operate much the same as teachers in the graded schools." This is the problem of differentiation of groups which was mentioned earlier.

In a comparison of within-grade and across-grade grouping for reading, Kierstead (1963) found that gains made in vocabulary and reading comprehension over one school year were not significantly different at any level of intelligence. It is presumed that across-grade grouping approximates the units system of nongrading.

Hopkins, Oldridge, & Williamson (1965) were able to compare achievement of pupils in the two types of approach with the nongraded schools being set up specifically for such a test. Twenty nongraded and 25 graded classrooms were used. Comparisons of the two groups were made at the beginning and end of Grade 3. Using scores on the California Test of Mental Maturity as a covariate it was found that children in the graded classes had significantly higher mean scores on vocabulary and reading comprehension early in Grade 3. By the end of Grade 3 these differences had disappeared. Unfortunately, no results are given for the previous grades, so that a complete assessment of the program is not possible.

Measures of sociometric choice and attendance were also taken. No significant difference was found on either.

It is possible that this study faced the same problem as that found by Carbone, that the schools may, in fact, have failed to differ sufficiently to justify the assumption that two systems were being tested.

Conclusions

The majority of the studies reviewed suffer from the major methodological defect that the control groups have not been shown to be both comparable to, and yet different from, the experimental groups. Because of these difficulties it must be assumed that in most studies no test has, in fact, been made of the effect of the levels or units system. In some cases the use of a system of nongrading has apparently led teachers to modify their methods. In others, as Carbone (1961) has shown, the name may have been changed without a corresponding change in the approach.

At this time we can only conclude that the case for the levels system is not yet proven, and may not have been tested. Until it can be shown that the methodological difficulties have been overcome in studies of nongrading, the results must be sufficiently suspect for educators to avoid basing important decisions on research in this area.

It is apparent that there is a need for more research employing larger numbers of schools with, if possible, random assignment of subjects and

teachers, and with more effort devoted towards ensuring that the methods differ, but differ only in the use of the levels system. In addition, because of the vague nature of the terms used, it is desirable that those who report such studies describe in rather more detail the methods and programs in the schools chosen for study.

Bibliography

- Anderson, R. H., & Goodlad, J. I. Self-appraisal in nongraded schools: A survey of findings and perceptions. *Elementary School Journal*, 1962, 62, 261-269.
- Bernard, J. A common fallacy in achievement test norms. *Psychology in the Schools*, 1964, 1, 428-431.
- Bernard, J. Achievement test norms and time of year of testing. *Psychology in the Schools*, 1966, 3, 273-275.
- Brody, E. B. Achievement of first- and second-year pupils in graded and non-graded classrooms. *Elementary School Journal*, 1970, 70, 391-394.
- Buffie, E. G. W. A comparison of mental health and academic achievement: The nongraded school vs. the graded school. Unpublished doctoral dissertation, Indiana University, 1962.
- Carbone, R. F. A comparison of graded and nongraded elementary schools. *Elementary School Journal*, 1961, 62, 82-88.
- Douglass, M. P. Reading and nongrading in the elementary school. *Claremont College Reading Conference Yearbook*, 1967, 85-95.
- Goodlad, J. I., & Anderson, R. H. Educational practices in nongraded schools: A survey of perceptions. *Elementary School Journal*, 1962, 63, 33-40.
- Halliwell, J. W. A comparison of pupil achievement in graded and nongraded primary classrooms. *Journal of Experimental Education*, 1963, 32, 59-64.
- Hart, R. H. The nongraded primary school and arithmetic. *The Arithmetic Teacher*, 1962, 9, 130-133.
- Hillson, M., Jones, J. C., & Van Devender, F. A controlled experiment evaluating the effects of a non-graded organization on pupil achievement. *Journal of Educational Research*, 1964, 57, 548-550.
- Hopkins, K. D., Oldridge, O. A., & Williamson, M. L. An empirical comparison of pupil achievement and other variables in graded and ungraded classes. *American Educational Research Journal*, 1965, 2, 207-215.
- Jones, J. C., Moore, J. W., & Van Devender, F. A comparison of pupil achievement after one and one-half and three years in a non-graded program. *Journal of Educational Research*, 1967, 61, 75-77.
- Kierstead, R. A comparison and evaluation of two methods of organization for the teaching of reading. *Journal of Educational Research*, 1963, 56, 317-321.
- Morris, V. R. An evaluation of pupil achievement in a nongraded primary plan after three, and also five years of instruction. Unpublished doctoral dissertation, Lehigh University, 1968.
- Skapski, M. K. Ungraded primary reading program: An objective evaluation. *Elementary School Journal*, 1960, 61, 41-45.
- Williams, W. Academic achievement in a graded school and in a non-graded school. *Elementary School Journal*, 1966, 67, 135-139.

V. THOMAS

The University of Calgary

The Basic Writing Vocabulary of Elementary School Children

It was the purpose of this study to determine, on the basis of frequency of usage, those 2,000 words which appear most frequently in children's writing during their first six years of public education in Alberta. Samples of original and unmarked children's written compositions were collected from 35 different Alberta School jurisdictions. Of the 25,000 samples collected, 1,287 were randomly selected for analysis. Results indicate that a small number of high frequency words continues to dominate children's writing. However, the actual words within this core appear to indicate a noticeable change from previous studies done in the U.S.A.

Although numerous vocabulary studies have been carried out in the United States in the past (Thorndike, 1921; Tidyman, 1921; Gates, 1926; E. Horn, 1926; Buckingham and Dolch, 1936; Rinsland, 1945) very few have examined children's own writing. The major research thus far concerning children's own usage was carried out by Henry D. Rinsland in his nationwide study of writing samples collected from students in grades 1-8. No similar major studies appear to have been carried out in Canada, although "A Canadian Word List" (Stothers et al., 1947) was compiled on a different basis. Consequently, Canadian educators and textbook writers have had to rely heavily upon American vocabulary lists which may not necessarily be meeting the particular regional needs in Canada. Furthermore, it is common knowledge that language is by no means static and it is evident that new words are coming into our speech and writing patterns almost daily. Yet, even today, it is necessary to rely on studies which could be badly out of date in terms of children's actual usage and linguistic need.

Problem

This research, which was limited to a sampling of writings collected exclusively from Alberta elementary schools, was designed in part to serve as a pilot study for obtaining and analyzing similar samples from

all provinces in Canada. Furthermore, it was the purpose of this study to determine, on the basis of frequency of usage, those 2,000 words which appear most frequently in children's writing during their first six years of public education. Such findings in part and in whole, were also to be compared with similar results available from the Rinsland study, 1945.

Method

Based on the "List of Operating Schools in Alberta, 1970-71" compiled by the Operational Research Branch, Department of Education, 38 county, division, public and separate school superintendents were contacted for permission to request writing samples from elementary schools within their jurisdictions. These particular systems were chosen to provide a broad and proportionate sample of schools varying in size, geographic location, socio-economic status, as well as to provide a balance between rural and urban districts. Replies granting permission for the study were received from 35 of the 38 superintendents concerned.

Further permission and co-operation was then sought from the principals and teachers of a representative sample of elementary schools within each jurisdiction. Material was also provided for each teacher wishing to participate. In addition to outlining the major purposes of the study, the teachers' material provided specifications for writing samples. In this regard, teachers were encouraged to submit *original* and *unmarked* material written by elementary school children. They were requested to submit only those compositions in which students had complete freedom with respect to the form and the content of the writing. Such writing could include personal letters, stories, poems, projects, reports, articles for school newspapers, etc. Teachers were encouraged to include *all* children in their classes and were asked not to submit more than two samples per individual pupil. Each sample of writing was to be labelled with the following information: age in years, grade and sex. All materials were collected during the latter part of May or early part of June, 1971. These were then mailed directly to the researcher.

A total sample of approximately 25,000 separate compositions, or about 2,500,000 running words, was received. Since it was not economically feasible to analyze the total sample, every 20th composition was randomly selected at each grade level and subjected to a word frequency count. Additionally, those samples which obviously did not meet the necessary specifications were discarded.

The lexical unit employed by Rinsland was used in counting and tabulating words. In this regard, plurals, contractions, abbreviations, etc., were tallied separately. Although illegibles were deleted, correct forms intended when words were spelled incorrectly were counted. Furthermore, proper names of persons and places, except where very well known, were also deleted.

For the final analysis, a total of 1,287 individual writing samples were selected. This total and the grade distribution are shown in Table 1. All compositions thus selected and amended in accordance with the above mentioned specifications were then processed by keypunch operators in preparation for computer analysis. Frequency counts were then made on the

IBM/360 by using the General Index Generator (The University of Calgary Data Centre).

As shown in Table 1, the selected sample of 1,287 compositions produced a total of 117,878 running words. A more noteworthy statistic, however, is the fact that only 7,365 different words were contained within this total. The number of different words used at each grade level shows a continuous progression from grade one through grade six. This is not true, however, for the average number of running words per composition since there appears to be a slight falling off from grade two to grade three.

TABLE 1

NUMBER OF COMPOSITIONS AND FREQUENCY COUNTS FOR EACH GRADE

GRADE	Number of Compositions	Number of Running Words	Number of Different Words	Average Number of Words per Composition	Average Number of Different Words per Composition
1	210	6,384	988	30	4.7
2	208	13,918	1,657	67	8.0
3	218	14,018	1,835	64	8.4
4	212	23,582	2,908	111	13.7
5	217	29,137	3,610	134	16.6
6	222	30,839	3,883	139	17.5
TOTALS	1,287	117,878	7,365	92	5.7

When no reference was made to grade level, the 50 different words most frequently used by Alberta students accounted for almost one-half of all words contained in their sample writings. Corresponding figures are shown in Table 2 for other groups of words in this and the Rinsland study.

TABLE 2

FREQUENCY OF WORD USAGE COMPARED WITH RINSLAND STUDY

Number of Different Words	Percentage of Total Word Count	Percentage for Rinsland Study
50	48	40
100	58	60
200	67	71
500	78	82
1,000	83	89
1,500	87	93
2,000	89	95

It should be noted, however, that the Rinsland results are based on a combined grades 1-8 sample, whereas, the Alberta figures represent only grades 1-6. It should further be noted that although the corresponding percentages between the two studies are often relatively close, further differences were found to exist between the actual words contained in each list. In this regard, the 100 words most frequently used by Alberta students account for 58% of all words used and this compares favorably with the 60% for the corresponding group of words in the Rinsland study. On the other hand, there is only an 80% correspondence between the 100 words currently being used in Alberta and the 100 words used by American students in 1937.

In addition to compiling a non-graded list of the 2,000 most frequently used words, a further analysis was made to determine the 100 most frequently used words at each grade level. In view of the overlap of words from one grade to the next, the grade one list follows in its entirety; the grade two list contains only those words which are not already included in the grade one list; the grade three list contains only those words which are not found in either of the two previous lists, etc. for the remaining grades.

GRADE ONE

The 100 Most Common Words in Order of Frequency

the	little	got	out
and	can	ride	pretty
about	dog	big	ran
I	with	fun	see
a	some	once	go
my	mother	said	going
to	that	so	home
we	for	them	name
was	play	elephants	school
it	house	his	this
he	cat	kitten	too
in	flowers	nice	upon
like	pony	pet	were
on	her	all	did
went	there	look	him
have	elephant	do	put
one	at	mom	took
had	but	came	be
are	time	dad	baby
they	very	love	because
she	when	now	white
you	saw	spring	sister
me	will	got	am
then	up	not	dear
		our	has

GRADE TWO

would	tree	am	I'm
could	back	how	just
down	into	come	their
if	after	bear	two
what	off	told	where

boy	good	father
people	man	Hallowe'en

GRADE THREE

horse	black	what	three
acorns	water	as	trees
scamp	friend	Christmas	
sun	swimming	space	

GRADE FOUR

change	hear	night	first
think	from	long	fish
over	or	around	
by	it's	taste	
smell	caught		

GRADE FIVE

know	last	way
old	us	cave
started	who	

GRADE SIX

your	no	write
car	well	only

The grade one list of 100 words used most frequently accounts for 69% of all words contained within the grade one sample; the grade two list accounts for 65% of all words written at that grade level; grade three—63%; grade four—58% ; grade five—57%; and grade six—56%. The cumulative list of 170 words for all six grades would account for almost two-thirds of the written vocabulary used by children in these grades.

Discussion

This research tends to support the findings of previous similar studies which reveal that children use a comparatively small number of different words in their writing. Thus a small core of high frequency words continues to exist in somewhat similar proportions to those indicated in previous studies. However, this study indicates that the actual words contained within the core have changed even within the very basic list of 100 most frequently used words. The differences become greater as the core gets larger. However, the fact that some written words are used with considerable repetition appears to have some practical implications for educators. The normal sequence of language learning suggests that these written words would first have become a part of the child's experience as well as his listening, speaking and reading vocabularies. Having prior knowledge about the words children will want to use most often in their writing, can thus enable language arts teachers to develop the child's oral and written linguistic competence with respect to such words. Corrective and remedial work could be quite heavily based on a small core of words which are known to be most essential in terms of actual usage. Such information should also

prove invaluable to textbook writers, especially those related to reading and spelling.

It must be remembered that such frequency lists are not meant to provide more than that basic core of words which most children use most often. Nor are the grade designations of prime importance. Beyond the basic core of 2,000 words, vocabularies become highly individualistic both in terms of frequency and the grade level at which they are used. The use of a core vocabulary will always leave considerable scope for the individual to also employ a number of words which are highly peculiar to his own experiences, interests, and abilities.

The main limitation of this study was the size of the sample of writings which was actually analyzed. Although this may have been partially offset by the fact that the writings were randomly selected from a sample which was twenty times that size, further data should be gathered and analyzed in order to validate the present findings. Repeating the study on a region-by-region, cross-Canada basis may therefore be useful for several reasons. A much larger and broader sample could provide comparable data to that used by Rinsland. It would also permit a comparison of word frequency usage from one province to the next or from one geographic area to another. In this regard, it would be interesting to determine whether there is an identifiable writing vocabulary which is distinctive to particular regions or whether there is a common core which is largely Canadian.

References

- Buckingham, B. R., & Dolch, E. W. *A combined word list*. Boston: Ginn & Company, 1936.
- Gates, A. I. *A reading vocabulary for primary grades*. New York: Teachers' College, Columbia University, 1926.
- Horn, Ernest. A basic writing vocabulary—10,000 words commonly used in writing. *University of Iowa Monographs in Education, First Series, No. 4*, State University of Iowa, Iowa City, 1926.
- Rinsland, Henry D. *A basic vocabulary of elementary school children*. New York: Macmillan, 1945.
- Stothers, C. E., Jackson, R. W. B., & Minkler, F. W. *A Canadian word list*. Toronto: The Ryerson Press, 1947.
- Thorndike, E. L. *The teacher's word book of 10,000 words*. New York: Teachers College, Columbia University, 1921.
- Tidyman, W. F. *A Survey of the writing vocabularies of public school children in Connecticut*. Washington, D.C.: U.S. Bureau of Education, Teacher's Leaflet No. 15, 1921.

P. E. VERNON

The University of Calgary

The Validity of Divergent Thinking Tests

Whether divergent thinking tests are valid predictors of 'creativity' is difficult to prove in the absence of any clear definition of what creativity implies among children and adults in general. Moreover many attempts at validation have not adequately controlled for the influence of other factors such as verbal intelligence. In an investigation of a large group of Canadian adolescents in Grade 8, consistent results were obtained with a battery of verbal divergent tests. After holding verbal intelligence constant, there were significant correlations with numerous measures of achievement and interest, but not usually with measures of independence, unconventionality or other personality characteristics. The results differed markedly between the sexes, and the test battery showed superior validity among girls.

Introduction

In spite of widespread experimentation with so-called creativity tests over the past 10 years or more, there is little well replicated evidence regarding what they measure. Some advocates appear to imply that they will pick out the future creative genius, whether artist or scientist. Ausubel (1968), on the other hand, suggests that they have nothing to do with high-level creativity, and chiefly measure glibness, uninhibited self-expression and deficiency of self-criticism. MacKinnon's (1965) studies in fact indicate that Guilford-type tests do not differentiate highly creative architects, scientists and writers from more mundane professional workers in the same fields. Unfortunately there seems to be no accepted operational definition of what we mean by creativity in the general, non-genius, population; hence it has proved impossible to designate any satisfactory criterion of what the tests are trying to predict. It seems preferable then to banish the term 'creativity tests', and to refer to them as divergent thinking (DT) tests since, although some critics have questioned whether they measure anything different from conventional intelligence tests, many studies have confirmed that well-chosen tests do embody a factor which is partly distinguishable from 'g' or V (cf. Cropley, 1966).

Nevertheless there is a good deal of published evidence indicating that DT tests have some useful validity. Moderately good correlations have been

reported with such criteria as production of ideas in the classroom and in written composition, with teacher ratings, with interest in creative artistic or scientific pursuits, and (though less well replicated) with achievement in higher education courses and research work, and in certain occupations that call for independent and original thinking. Tests for younger pupils, e.g. below 11 years, and especially nonverbal-response tests, seem to be less reliable and valid than verbal-response tests at later ages. The present writer (1972a, 1972c) has summarized such evidence elsewhere, and he has drawn attention to the failure of most investigators to separate what is predicted by divergent thinking from what is predicted by the general intelligence or verbal ability component of DT tests. Cronbach (1968) has also stressed this point in his critique of Wallach and Kogan's (1965) research where he concluded that, when convergent ability is held constant, divergent ability adds very little to the prediction of cognitive output, though it does relate to qualities of social adjustment. He showed that stepwise multiple regression is a much more powerful analytic technique than Getzels and Jackson's (1962) or Wallach and Kogan's comparisons of students above and below average in convergent and divergent abilities.

Since relatively little work on divergent thinking has been done with Canadian adolescents (apart from Cropley, 1966) a large-scale investigation was planned into the relations of divergent thinking and field independence with a wide range of cognitive and personality variables. Tests were included which would enable the intelligence factor to be controlled, and sufficient subjects were tested to allow for separate analyses in boys and girls.

Samples and Test Battery

In April 1970, the following battery of nine DT group tests, lasting some 2½ hours, was given to 198 boys and 189 girls in Grade 8 of two junior high schools of Calgary, Alberta. The median age was 13:11 (though the range was from 12:4-17:0), and the score distribution on a standardized nonverbal intelligence test (Safran's Culture-Reduced) closely matched that for the city as a whole. Some 7½ hours additional tests of abilities, interests, social attitudes and personality were also given.

1. Torrance's Circles: making as many different drawings as possible, based on 1-inch circles (14 mins.).
2. Patterns: written interpretations of 8 figures, taken from Wallach and Kogan's Drawings and Lines tests (13 mins.).
3. Alternate uses for 5 objects (18 mins.).
4. Improvements: writing possible improvements to a house (cf. Torrance's Toy Dog test) (10 mins.).
5. Similarities: writing ways in which, e.g. a Cat and a Mouse are alike; 6 pairs (12 mins.).
6. Topics (Thurstone): writing ideas suggested by 'A Parcel' and 'A Man Climbing Up a Ladder' (13 mins.).
7. Consequences: 4 items, e.g. What would happen if everyone suddenly doubled in height? (15 mins.).

8. Multiple vocabulary (Hudson, 1966): writing as many meanings as possible for 8 easy words, e.g. post (14 mins.).

9. Group Rorschach (Vernon, 1969): written associations to blots VI, III and VIII, shown by colour slides (12 mins.).

Each test, or test item, was scored for the number of unusual responses, defined as responses given by less than 5 per cent of the subjects. The score distributions all showed strong positive skew, and were therefore converted to 10-point normalized scales for correlational purposes. Fourteen Grade 8 classes in all were involved and, as described elsewhere (Vernon, 1971), half the classes took the DT tests under conventional, formal conditions, while the other half did them under more relaxed or permissive conditions, with no timing for the first 7 tests, only an overall limit of two school double-periods. This part of the study showed that, under the relaxed conditions, the production of unusual answers tended to be higher, and the scores generally gave somewhat higher correlations with criteria of creativity and with other measures, including intelligence tests. However the differences were not large, and the factorial structure of the battery was generally similar under the two conditions. Hence the two subgroups were combined in the subsequent analysis; or rather the results for boys and girls were separated instead of those for formal and relaxed groups.

Other Variables

These were chosen with a view to studying a number of hypotheses concerning divergent thinking, and Witkin's (1962) construct of field independence.

1. Age (Youthfulness). 2. Parental socioeconomic status. 3-7. *General and Verbal Abilities*. 3. Otis Verbal. 4. Vocabulary. 5. Shipley Abstraction. 6. SCRIT. 7. Number Series. 8. Concept Maturity—acceptance of rational vs. irrational arguments.

9-15. *Spatial Abilities*. 9. Copying Figures. 10. Kohs Blocks (group version). 11. Paper Formboard. 12. Concealed Figures (Thurstone). 13. Embedded Figures (group version of Witkin's test). 14. Rod-and-Frame, daylight apparatus (individual), scored for total error. 15. Ditto scored for bias towards tilt of the frame.

16-19. *School Grades*. 16. English. 17. Social Studies. 18. Mathematics. 19. Science.

20-31. *Essays*. One essay asking for an autobiography up to age 30, and another on "Calgary as a place to live in", or on "My favorite leisure-time occupation", were marked by two experienced teachers of English on certain defined qualities. Autobiography: 20. Grammar. 21. Fluency. 22. Conceptual Maturity. 23. Imagination and Creativity. 24. Need for Achievement. 25. Sense of Social Responsibility. 26. Interest in a Scientific Career. 27. Interest in an Artistic Career. 28-31. The second essay was scored for the first four qualities only.

32-4. *McClelland's N Achievement Test*, group form. An alternative set of 4 pictures was chosen for girls to write about. 32. N Achievement. 33. Rating for literary style and fluency. 34. Rating for imagination and originality.

35. Total macabre DT responses.

36-9. *Drawing of a Man and a Woman*. 36. Body Sophistication, Witkin's scale. 37. Differentiation of sex characteristics. 38. Rating for drawing skill. 39. Rating for creativity.

40-3. *Choice of Traits Regarded as Desirable in a Friend*. Responses to 26 traits were factorized in the sexes separately, and found to fall into four main clusters. 38. Moral characteristics. 39. Personality qualities. 40. Abilities. 41. Sex-linked traits, e.g. 'tough' for boys, 'good taste in clothes' for girls.

44-8. *Sociometric Choices* of 3 persons of own sex in each of 5 situations. 44. For hiking-camping. 45. For a party. 46. For help in trouble. 47. For a creative project. 48. For a practical project.

49-53. *Ratings by 2 Teachers of Each Class*. 49. Conscientiousness. 50. Curious. 51. Sociable. 52. Independent. 53. General adjustment-maladjustment.

54-60. *Interests*. Strong-type blank, the items being classified under seven headings: 54. Mechanical. 55. Intellectual. 56. Outdoor. 57. Feminine. 58. Social. 59. Artistic, literary or musical. 60. Sporting.

61-7. *Safran Vocational Interest Inventory*. Preferences for seven types of occupation: 61. Economic-commercial. 62. Technical-mechanical. 63. Outdoor-athletic. 64. Service (Police, Hair Stylist, etc.). 65. Humane (Teacher, Nurse, etc.). 66. Artistic. 67. Scientific.

68-71. *School Subject Preferences*. 68. English. 69. Maths-Science. 70. Artistic, musical, dramatic. 71. Other, e.g. handwork, sports.

72-4. *Personal Data Questionnaire*. This included various questions on use of leisure-time, answers to which were summed to yield additional scores on: 72. Artistic-creative. 73. Scientific-creative. 74. Sporting.

75-81. *Sentence Completion Test*. Responses were scored for favourableness vs. unfavourableness to: 75. School. 76. Peers. 77. Family. 78. Own physique. 79. Self. Additional ratings were given for: 80. Defensiveness of responses. 81. Conceptual maturity.

82-92. *Personality and Attitudes Questionnaire*. This was constructed from 85 items aimed at various traits relevant to creativity and independence. The items were factorized and sorted out into clusters, which sometimes differed between the sexes. 82. Positive self-concept. 83. Need for achievement. 84. Self-satisfaction. 85. Independence from peers and adults. 86. Response set: Number of 'Untrues'. 87. Response set: Number of extreme responses, 'Very true' or 'Very untrue'. 88. Number of responses more characteristic of boys than of girls. 89. Conventionality—number of responses frequently endorsed by all subjects. 90. Boys only: Rebelliousness to school and adults. 91. Methodicalness-tidiness. 92. Girls only: Leadership among peers.

93-110 On the basis of Principal Component and cluster analyses, the above variables were grouped into a series of self-consistent though overlapping (oblique) clusters, as far as possible identical between the sexes: 93. 'g.' 94. V. 95. S or combined spatial-perceptual tests. 96. Total achievement. 97. Literary creativity, based mainly on Nos. 22, 23, 30, 31, 34, 39, 45, 50. 98. Conceptual maturity. 99. Total sociometric status. 100. Total teachers' ratings. 101. Science interests. 102. Art interests. 103. Sports interests. 104. Outdoor and physical interests. 105. Feminine vs. mechanical interests. 106. Masculine vs. conventional questionnaire responses. 107. Positive self-concept. 108. Acceptance of adult standards vs. rebellious (boys only). 109. Favourable to school (girls only). 110. Moral vs. independent and extreme responses (girls).

Results

Sex Differences. On all but two tests, Circles and Improvements, girls obtained higher mean scores, though the only significant differences were Consequences ($t = 3.24$), Rorschach (3.18), and Patterns (3.12). The t in favour of boys on the Circles test was 1.80. These results fit in with the general superiority of girls on verbal fluency tasks. Following Hudson's (1966) suggestion that divergent students are more likely to produce macabre or horrific associations, a separate point was given for each such response in all tests. They occurred mainly in Uses (e.g. Using the Brick

to bash in a teacher's or the tester's head). Boys produced significantly more ($t = 3.39$).

Consistency. The mean intercorrelations of the 9 tests in boys and girls were .274 and .329 respectively, giving overall consistencies of .772 and .815. These are the expected correlations of the total battery with another similar battery. Table I shows the first factor centroid loadings, which are fairly uniform for all tests except Circles. This was the only test involving

TABLE 1
FACTOR LOADINGS OF DIVERGENT THINKING TESTS IN BOYS
AND GIRLS

	First Factor Loadings		<i>gV</i> Loadings		DT Loadings, <i>gV</i> held constant	
	Boys	Girls	Boys	Girls	Boys	Girls
Circles	.20	.45	.14	.15	.14	.43
Patterns	.64	.71	.37	.26	.53	.66
Uses	.65	.63	.30	.23	.58	.60
Improvements	.54	.58	.36	.40	.41	.45
Similarities	.64	.61	.18	.12	.69	.64
Topics	.61	.60	.24	.17	.59	.60
Consequences	.61	.60	.41	.43	.46	.47
Multiple Vocabulary	.44	.55	.59	.60	.21	.36
Rorschach Inkblots	.51	.53	.31	.14	.42	.54
Variance Percent	30.7	34.6	11.9	10.1	22.9	28.7

graphic rather than verbal responses, and it tends to be highly specific in boys, rather less so in girls. As described elsewhere (Vernon, 1971), no further interpretable factors were obtained. For example, tests based on nonverbal stimuli (Circles, Patterns and Rorschach) did not differentiate from the verbal-stimulus tests, though there was a slight separation of Consequences and Improvements, i.e. tests in which novel predictions are helped by scientific knowledge.

Independence from Intelligence. The mean r 's with 5 convergent verbal and nonverbal intelligence tests were .213 and .191. It might appear that the correlation between DT tests is little higher than that between DT and CT (especially among boys), as in Getzels and Jackson's study. However when all 14 tests were factorized together, and the first factor rotated to maximize $g + V$, the rotated second factor, representing divergent thinking freed from the influence of intelligence, loaded the DT tests much more highly, as shown in Table I.

Note that gV and DT factor loadings are considerably more irregular from one test to another, though the pattern is quite similar in the two sexes. Multiple Vocabulary is much the nearest to an ordinary verbal intelligence test, Circles and Similarities least so.

Correlations with Other Variables. Another way of studying the same question is to correlate the additional variables, listed above, with the total

TABLE 2
CORRELATIONS OF BATTERY OF NINE DIVERGENT THINKING TESTS
WITH OTHER VARIABLES

No. Variable	First Order		Residual		No. Variable	First Order		Residual	
	Boys	Girls	Boys	Girls		Boys	Girls	Boys	Girls
94. V factor	46	43			51. Sociable	16	32	04	19
1. Youthfulness	27	13	06	08	52. Independent	21	19	08	14
2. Socioeconomic	28	23	09	13	53. Adjustment	-08	24	-08	15
6. SCRIT	35	24	12	02	100. Total ratings	25	40	05	24
7. Number Series	34	21	10	-08	54. Interest Blank				
93. g factor	41	30	13	02	Mechanical	-05	11	-04	06
8. Concept					55. Intellectual	17	07	05	03
Maturity	28	11	13	-01	56. Outdoor	08	06	07	03
9. Copying	23	28	04	07	57. Feminine	05	-15	-01	-12
10. Kohs Blocks	17	22	01	02	58. Social	05	-04	02	-03
11. Formboard	18	21	02	05	59. Artistic	-04	23	-03	19
12. Concealed					60. Sporting	10	09	10	10
Figures	38	28	17	10	61. Safran Interests	07	-21	01	-19
13. EFT	29	27	09	10	Economic				
14. RFT Errors	13	25	01	09	62. Technical	-21	04	-14	08
15. RFT Bias	11	19	-02	14	63. Outdoor	-02	16	-01	11
95. S factor	30	33	07	19	64. Service	-07	-16	-02	-15
16. English	39	47	06	16	65. Humane	10	-06	10	-05
17. Social Studies	37	38	10	13	66. Artistic	-02	11	02	06
18. Mathematics	26	29	05	07	67. Scientific	21	00	09	05
19. Science	38	40	11	17	68. School English	-04	01	-11	-06
96. Achievement	41	46	09	17	69. Maths-Science	14	03	04	01
20. Autobiography					70. Art	-14	13	-06	15
Grammar	37	49	13	03	71. Other	08	-09	05	-04
21. Fluency	41	32	16	14	72. *Leisure Art	16	40	14	28
22. *Maturity	31	27	23	21	73. *Leisure Science	26	14	20	13
23. *Imagination	26	28	11	07	74. Leisure Sport	13	16	10	14
24. N Achievement	19	11	09	02	101. Science				
25. Social					interests	30	10	15	09
Responsibility	19	-03	17	-08	102. Art interests	01	34	02	23
28. Essay Grammar	28	38	09	15	103. Sports interests	07	15	07	14
29. Fluency	27	42	09	24	104. Outdoor-				
30. *Maturity	24	43	11	29	physical	00	13	01	08
31. *Imagination	24	30	14	11	105. Feminine vs.				
32. TAT NACH.	25	26	14	12	Mechanical	11	-19	06	-17
33. Style	35	25	14	06	81. Sentence Com-				
34. *Imagination	42	35	18	15	pletion				
35. Macabre DT	35	27	24	27	Maturity	30	16	17	03
97. Literary					82. Self-Concept	02	-06	01	-04
Creativity	48	62	24	40	83. N Achievement	29	02	18	-03
98. Conceptual					84. Satisfaction	02	14	10	10
Maturity	39	28	19	07	85. Independence	-09	14	-16	13
36. Witkin score	13	32	04	18	86. Untrues	-07	09	-09	04
37. sex	11	30	11	26	87. Extremes	-02	21	01	18
38. skill	08	20	04	10	88. Maculine-				
39. * creativity	08	24	07	21	Feminine	19	-02	04	00
40. Traits, moral	06	08	03	07	89. Conventionality	-13	07	-03	10
41. personal	20	13	08	06	90. Rebellious	-15		-12	
42. ability	-19	07	-08	08	91. Methodical	14		17	
43. sex	-01	-23	-02	-17	92. Leadership		22		16
44. Sociometric hike	02	13	06	16	106. Masculine vs.				
45. party	-03	07	-01	06	Conventional	17	-05	02	-06
46. trouble	18	08	14	05	107. Self-concept				
47. * creative	08	26	02	22	total	16	08	13	05
48. practical	-03	14	-03	09	108. Accepting adults	06		13	
99. Total status	05	17	04	15	109. Accepting				
49. Teacher rating:					school		01		01
Conscientious	26	32	08	16	110. Moral vs.				
50. *Curious	33	41	11	22	Independent		-02		-03

DT battery and with verbal ability, and thus to obtain the residual correlations with DT, holding *V* constant. This is a simplification of Cronbach's procedure, and it was conducted for the two sexes separately. As an example, the correlation of summed DT tests (by Spearman's Correlation of Sums formula) with Youthfulness in boys was .27, the correlation of Youthfulness with summed *V* tests .45, and of DT total with *V* .46. Thus the residual *r* between Youthfulness and DT = $.27 - .45 \times .46 = .06$, which is not significant.

Such residuals become significant at the .05 level when they reach .11 or over in 198 boys, and .12 in 189 girls. These results are shown in Table II, with the significant residuals italicized. Obviously, little stress should be laid on borderline coefficients obtained from about 100 criteria, many of which doubtless overlap. But it is reasonable to take note of correlations with clusters of related criteria, also of residuals which greatly exceed the borderline. Ten of the variables are asterisked: these were the ones which were specifically hypothesized as criteria of creativity in school work and daily life.

It will be seen that there is still some residual correlation of DT with 'g' tests in boys only, and quite a marked residual of .19 with summed spatial tests in girls. A possible relation between DT and Witkin's field independence had been hypothesized, but this must be rejected among boys for whom Concealed Figures is the only test to yield a significant residual. Sex differences are even more marked in the areas of achievement and teachers' ratings. Teachers clearly like the divergent thinking girl, rating her high on various qualities and giving her high marks in most subjects. In boys there are borderline coefficients only with Science marks and ratings for Curious. However there is no confirmation for Getzels and Jackson's finding of a negative relation between 'creativity' and likeability. Similarly the divergent thinking girl tends to receive above average sociometric ratings from peers, especially in a creative situation; but in boys there is only a moderately significant residual of .14 for choice of friends who will be helpful in trouble.

Most of the marks awarded to the essays, and for the TAT stories, give significant correlations in both sexes. But the markers fail to discriminate between imaginative and other qualities. Their marking for Conceptual Maturity tends to give higher residuals with DT than that for Imagination. Clearly, though, DT scores relate quite highly to various aspects of written English, the raw correlations often reaching the .30's or .40's. They relate too to drawing ability in girls but not in boys (cf. the results already mentioned for the *S* factor).

Elsewhere the writer (1972b) has drawn attention to a major polarization of girls' attitudes and interests which contrasts career, academic (especially scientific) and outdoor-sporting interests on the one hand with feminine and social interests and non-career vocations such as secretary, air hostess, on the other hand. DT gives smallish but significant negative residuals in girls with: 57. Feminine. 61. Economic. 64. Service, and 105. Feminine vs. Mechanical interests; positive with: 59. Artistic. 70. Art subjects in school, and with 72-4. Leisure-time Art, Science and Sporting interests. Thus divergent thinking in girls expresses itself mainly

in relation to literary and artistic activities (Nos. 97 and 102). But in boys it correlates strongly with 98. Conceptual Maturity, and 101. Science interests, as well as with 97. Literary creativity, but not at all with 102. Art interests. Note also the significant negative residual with 62. Technical vocation, which tends to be the choice of the less academic boys.

Turning to personality instruments: none of the Sentence Completion scores (75-80) yield DT residuals of even borderline significance, though 81. Conceptual maturity of completions gives a significant coefficient in boys. The results with the personality and attitudes questionnaire were disappointing. There was some tendency for high-divergent boys to show strong Need Achievement (83) and Methodicalness (91), to hold positive self-concepts (107), and to conform to school and adult standards rather than expressing rebellious or independent opinions (85, 90, 108). On the other hand high-divergent girls tend to be strong in Leadership (92), and Independence (85), and to give an excess of extreme responses (87). In neither sex was there a significant negative residual with measures of conventionality, Nos. 88 and 89. It is quite possible, of course, that other questionnaires or personality tests might have been more revealing. Our results provide little confirmation for the picture of the 'high-creative' drawn by Getzels and Jackson or Wallach and Kogan, nor for the divergent-convergent types of Hudson. However there is striking agreement with a research by Parloff et al. (1968) on talented boy scientists. Those students who had produced the most creative research projects were superior to the less creative (but equally achieving) students on a personality factor termed Disciplined Effectiveness, as measured by the California Psychological Inventory. That is, the creatives did not show the nonconformist, rebellious or Bohemian characteristics which had been noted by MacKinnon among his high-creative adults.

Validity Coefficients. Finally a scholastic and daily-life criterion of

TABLE 3
VALIDITY COEFFICIENTS OF DIVERGENT THINKING TESTS

	<i>r</i> with Creativity Criterion		Ditto, <i>V</i> held constant	
	Boys	Girls	Boys	Girls
Circles	.10	.25	.06	.16
Patterns	.24	.47	.09	.36
Uses	.32	.38	.20	.28
Improvements	.32	.45	.19	.28
Similarities	.30	.35	.24	.28
Topics	.27	.37	.19	.29
Consequences	.39	.48	.25	.28
Multiple Vocabulary	.46	.53	.17	.21
Rorschach Inkblots	.32	.34	.18	.28
Total DT Battery	.51	.63	.29	.42

creativity was obtained from the sum of the asterisked variables, including essay ratings, teacher and peer judgments, and leisure-time artistic and scientific activities. The correlations of each DT test with this criterion, and the residuals when verbal ability is held constant, are shown in Table III. The first order correlations are quite substantial for all tests but Circles, and the validities for the total battery of .51 in boys and .63 in girls suggest that such a battery would be of real diagnostic value to secondary school teachers and counsellors. However much of the prediction is attributable to verbal ability. The DT battery still adds significantly, but its residual coefficients drop to .29 in boys and .42 in girls. In terms of variance, verbal ability predicts 22.8 per cent of the criterion and DT adds 8.1 per cent for boys; the corresponding figures for girls are 23.8 per cent and 17.9 per cent.

Conclusions

The following is a summary of the main points established in this investigation. It should be remembered that these are considered as applying only to white students aged about 13 to 15 years.

1. Group divergent thinking tests based on verbal responses to verbal or nonverbal stimuli, and scored for unusualness, yield an internally consistent factor which correlates with, but is relatively distinct from, convergent verbal ability. It is somewhat, but not greatly, affected by the conditions of administration.

2. Girls tend to score more highly on all such tests, and their scores generally show higher consistency and validity.

3. The contributions of divergent thinking tests to psychological diagnosis cannot be adequately determined without taking steps to hold constant their verbal ability (V factor) component. When this is done, the tests show poorer validity than has been claimed by many advocates of 'creativity' testing, but better than that indicated by L. J. Cronbach's critique.

4. There is a small positive correlation with Witkin's field independence in girls, none in boys.

5. Divergent tests correlate significantly in girls with school achievement, with teacher ratings of personality qualities, and to a lesser extent with sociometric popularity. In boys there are borderline correlations with only a few such variables, e.g. science grades. In neither sex does divergence make for unpopularity with teachers or peers.

6. There are significant correlations with qualities of written English, though not necessarily with imagination or originality as marked by teachers of English. With drawings of human figures, correlations are confined to girls.

7. There are marked differences in interest patterns between the sexes. Divergent thinking tends to correlate negatively with conventional feminine interests in girls, positively with artistic interests and leisure pursuits. In boys it is mainly related to scientific interests, also to measures of Conceptual Maturity.

8. Personality patterns are more obscure; but on the whole boy di-

vergers tend to show high need for achievement, positive self-concepts, and acceptance of adult and school standards; whereas girls tend to show more independence and leadership.

9. With a composite criterion of creativity at school and in daily life, the overall validity of the battery of divergent tests was .51 in boys and .63 in girls. But these coefficients drop to .29 and .42 when V factor is held constant.

References

- Ausubel, D. P. *Educational Psychology: A Cognitive View*. New York: Holt, Rinehart and Winston, 1968.
- Cronbach, L. J. Intelligence? Creativity? A parsimonious reinterpretation of the Wallach-Kogan data. *American Educational Research Journal*, 1968, 5, 491-511.
- Cropley, A. J. Creativity and intelligence. *British Journal of Educational Psychology*, 1966, 36, 259-266.
- Getzels, J. W. and Jackson, P. W. *Creativity and Intelligence: Explorations with Gifted Students*. New York: Wiley, 1962.
- Hudson, L. *Contrary Imaginations*. London: Methuen, 1966.
- MacKinnon, D. W. Personality and the realization of creative potential. *American Psychologist*, 1965, 20, 273-281.
- Parloff, M. B., Datta, L., Kleman, M. and Handlon, J. H. Personality characteristics which differentiate creative male adolescents and adults. *Journal of Personality*, 1968, 36, 528-552.
- Vernon, P. E. *Intelligence and Cultural Environment*. London: Methuen, 1969.
- Vernon, P. E. Effects of administration and scoring on divergent thinking tests. *British Journal of Educational Psychology*, 1971, 41, 245-257.
- Vernon, P. E. The usefulness of 'creativity tests'. *The School Guidance Worker*, 1972a, 27(4), 30-35.
- Vernon, P. E. Sex differences in personality structure at age 14. *Canadian Journal of Behavioural Science*, 1972b, 4, 283-297.
- Vernon, P. E. Book review, and commentary on 'Creativity'. *Canadian Journal of Behavioural Science*, 1972c, 4, In Press.
- Wallach, M. A. and Kogan, N. *Modes of Thinking in Young Children: A Study of the Creativity-Intelligence Distinction*. New York: Holt, Rinehart and Winston, 1965.
- Witkin, H. A., Dyk, R. B., Faterson, H. F., Goodenough, D. R. and Karp, S. A. *Psychological Differentiation: Studies of Development*. New York: Wiley, 1962.

J. F. MARTIN

The University of Alberta

The Relationship Between Neuroticism and Attainment

Using a sample of 200 Canadian high school students, this study was primarily concerned with discovering the relationships between neuroticism and associated variables, as operationally defined by the Neuroticism Scale Questionnaire (Cattell and Scheier, 1961), and academic attainment as measured by four achievement subtests (mathematics, science, Social studies, and English) found in the Stanford Achievement Test—High School Battery. The major finding was that neuroticism is unrelated to overall academic attainment for the high school sample. Although no global relationship was found, some interesting relationships were shown to exist between specific neurotic subvariables and specific achievement tests.

I. Introduction

The relationships between academic attainment and scores on the personality inventories devised by Cattell and Eysenck have been investigated for both students and school children. Many such research studies have been carried out, in Great Britain and the United States in particular. Unfortunately, despite the prodigious amount of work which has been done in this area, results have not been of a uniform nature such as to permit the precise elucidation of these relationships. This is increasingly perplexing in view of the gradual evolution of a consensus amongst major research workers in the area of personality test construction with regard to basic personality dimensions and their measurement.

At the university level, Furneaux (1956) found that British students who do well (Oxford in this case) score more highly on neuroticism than other students. In 1962, Furneaux reported that neurotic introverts had the lowest rate of failure in examinations at a university level. Kelvin and his co-workers (1965) confirmed the superiority of the neurotic introverts in this regard, adding that student failures tended to be neurotic extraverts. Lynn and Gordon (1961), working with male university students, report a positive correlation between neuroticism, as measured by the *Maudsley Personality Inventory*, and size of vocabulary. They also

report a curvilinear relationship between neuroticism and scores on Raven's matrices, subjects in the middle range of neuroticism doing best. The fact that Lynn and Gordon use the Yerkes-Dodson law as a theoretical basis for their assertions has been criticized rather severely by Biggs (1962). The idea that curvilinearity might explain contradictory findings in the area of neuroticism and attainment was also posited by Eysenck and White (1964), though on somewhat different grounds.

A number of research programs sponsored by the Institute for Personality and Ability Testing at the University of Illinois, have in general pointed to a relationship between stability (the other end of the neuroticism-stability dimension) and attainment. Ballham (1960) found this to be the case for a sample of 103 secondary modern school children, aged 12-15. Warburton and Hadley (1960), and Holmes (1960) corroborated this finding for samples of college populations. Two major research studies on the prediction of scholastic attainment from intelligence, motivation, and personality measures by Butcher, Ainsworth, and Nesbitt (1963) and Cattell, Sealy, and Sweney (1966), making use of both American and British samples of school children aged 12-15, found significant associations between stability and attainment.

Rushton (1968), using *Cattell's Children's Personality Questionnaire*, found that the second-order factors of anxiety and neuroticism correlated negatively with verbal reasoning and school records based on teacher ratings of ability. A final study which will be mentioned is by Entwistle and Cunningham in 1968. This was a follow-up study of 2,995 Aberdeen children aged about 13 years. Evidence was that the relationship between stability and attainment is positive and linear.

The research reported here is an attempt to establish the relationship between neuroticism and academic attainment for a sample of Canadian high school students. The particular nature of the testing instruments used permits not only an analysis of this relationship, but also of the relationships between several neurotic-associated personality dimensions and attainment. It was hoped that a more specific approach of this kind might furnish information which would bear directly on the origin of the inconsistencies abounding in the literature.

The specific hypotheses examined were: (1) For a Canadian sample of high school students, is neuroticism related, positively or negatively, to school attainment? (2) Is the relationship non-linear? (3) Are there sex, rural-urban, or matriculation—non-matriculation differences in the nature of the relationship which may exist? (4) Is there a specific pattern of neuroticism variables which clearly defines the relationship between academic attainment and overall neurotic level?

II. Method

To test these hypotheses, Cattell and Scheier's (1961) *Neuroticism Scale Questionnaire (NSQ)* and the science part A, mathematics part A, English, and social studies tests in the *Stanford Achievement Test—High School Battery Form W* (Gardner et al., 1965) were administered to a sample of 200 Grade XI, high school students attending either the rurally situated Composite High School located in Ponoka, Alberta; or the urban

M. E. Lazerte Composite High School situated in the city of Edmonton, Alberta. Of the 200 students, 144 were from Ponoka and 56 from Edmonton; 102 were male, 98 female; 119 were enrolled in matriculation programs (aimed at preparing students for university entrance) and 81 were non-matriculation or diploma students.

The test administration was done on a class basis. Social science classes (i.e. either social studies, psychology, sociology or English classes) were chosen because they provided the desirable mixture of matriculation and non-matriculation students. Five classes were tested in Ponoka, two in Edmonton. All the classes tested in both schools were selected at random from the total number of social science classes available.

In this manner scores were obtained from the 200 students on the four Stanford achievement measures as well as on the four personality dimensions measured by the *NSQ*—tender-mindedness (I), depressiveness (F), submissiveness (E), and anxiety (cf. *Neuroticism Scale Questionnaire Handbook*—Cattell and Scheier, 1961). Scores on these variables were summed to determine a total achievement score; a total-neurotic—level score for each individual was also calculated. Thus, the total number of variables measured was ten.

The analysis of data was carried out using computer programs developed at the Division of Educational Research Services, The University of Alberta. Two analyses of variance and a factor analysis were carried out on the data.

III. Results

Table 1 consists of Pearson correlations between the eight independent variables. (Total neurotic level and total achievement are not included since these variables are composites.)

TABLE 1
CORRELATIONS BETWEEN NEUROTICISM AND ATTAINMENT:
GRADE XI, ALBERTA STUDENTS
(n=200)

	English	Mathe- matics	Social Studies	Science	I	F	E	Anxiety
English	*	.435	.496	.420	.255	.039	.099	-.021
Mathematics		*	.498	.556	-.041	.105	-.085	-.123
Social Studies			*	.616	.057	-.014	-.086	-.074
Science				*	-.122	.089	-.210	-.111
I—tender-mindedness					*	-.108	.237	.158
F—depressiveness						*	.124	.019
E—submissiveness							*	.147
Anxiety								*

* Correlations greater than 0.145 significant at .05 level.
** Correlations greater than 0.200 significant at .01 level.

The relatively high correlations amongst the achievement subtests are not surprising. However, the correlation between English achievement and tender-mindedness is unexpected: the significance of the relationship is confirmed by analysis of variance. The negative correlation between science and submissiveness is not supported at the level shown by subsidiary analyses.

Correlations between the *NSQ* variables in Table 1 are generally of the same order as those reported by Cattell and Scheier (1961), although submissiveness, anxiety and tender-mindedness appear to be less independent than was indicated by these authors. Differences in culture and age of samples may account for these differences.

The principal components factor analysis of the Pearson correlations gives a summary picture of the findings (Table 2).

TABLE 2
FACTOR ANALYSIS: PRINCIPAL COMPONENTS
(n=200)

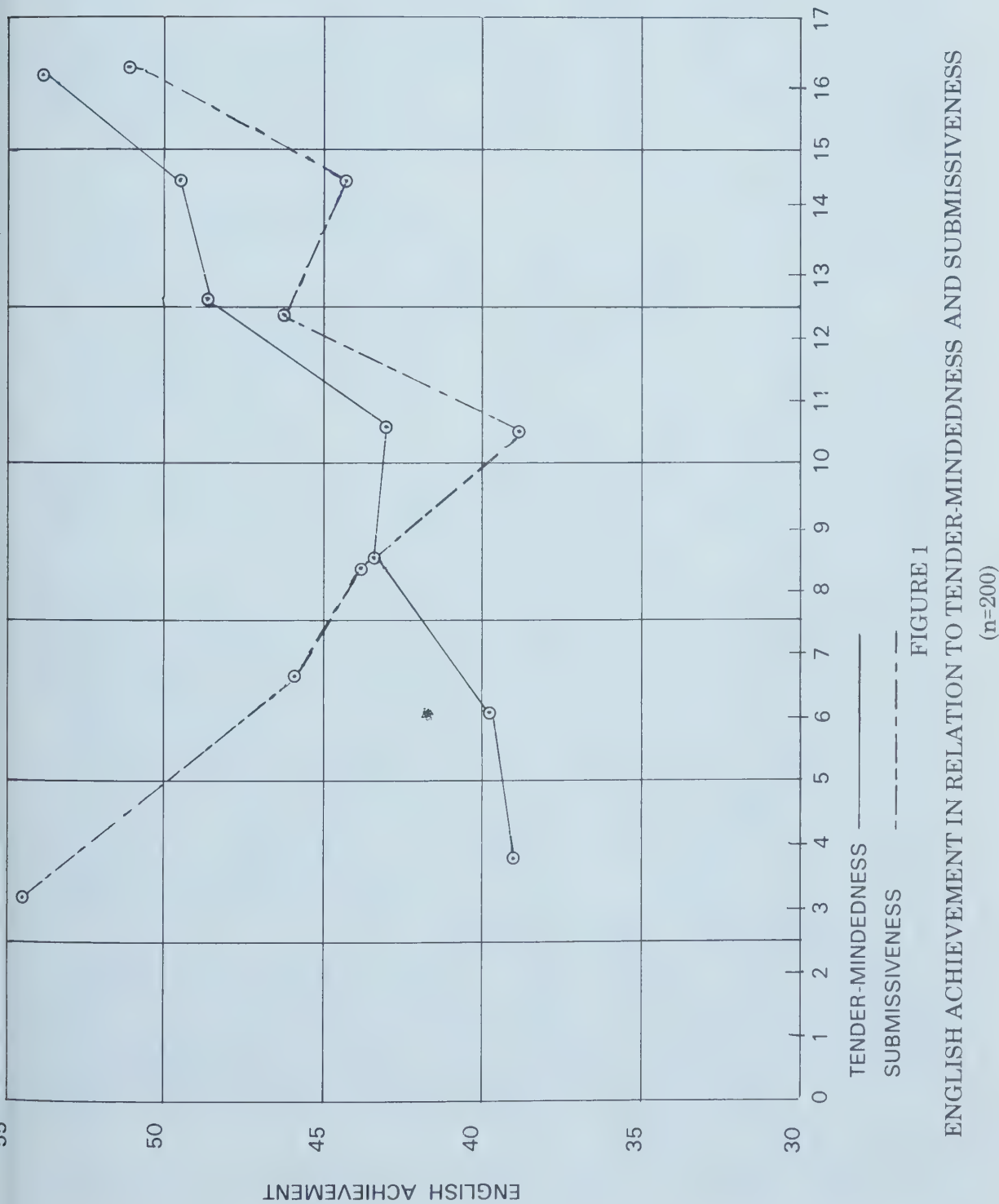
	Factor 1	Factor 2
English	.70	.43
Mathematics	.79	.04
Social Studies	.83	.08
Science	.84	.17
Tender-mindedness	.01	.77
Depressiveness	.06	.06
Submissiveness	-.17	.66
Anxiety	-.19	.47

From this analysis it is clear that none of the *NSQ* variables have high loadings on Factor 1: this seems to be a general achievement factor. This suggests that no significant relationship exists between neuroticism and overall academic attainment.

However, loadings on Factor 2 indicate that although total neurotic level may be divorced from total achievement, English achievement in this sample is certainly related to three of the four *NSQ* subvariables—*anxiety*, *submissiveness*, and *tender-mindedness*. Cattell and Scheier's descriptions of these variables suggest that Factor 2 may be a social passivity factor.

To clarify further the relationships between the Stanford achievement tests and the *NSQ* variables, the total sample of 200 students was classified in seven groups in terms of their scores on *NSQ* variables as well as on total neurotic level. One-way analyses of variance were then carried out on the achievement tests scores. In this way, 25 analyses were carried out. This procedure was also carried out for sub-groups classified by sex, rural-urban, and matriculation—non-matriculation differences. Where significant results were found, further analyses of trends were carried out to discover the nature of the relationships (whether linear, quadratic, cubic, or quartic).

Using the entire sample, only two of the analyses of variance discovered any significant relationships. These were between tender-mindedness and English achievement, and submissiveness and English achievement. On the basis of the trends of the means, analysis reveals that the



relationship between tender-mindedness and English achievement is positive and linear, whereas the relationship between submissiveness and English achievement is non-linear, being quadratic in form (see Figure 1). In other words, both high and low English achievement scores are associated with submissiveness. (The curvilinear nature of the relationship explains the non-significant Pearson correlation between submissiveness and English achievement.)

The analyses by sex, rural-urban and matriculation—non-matriculation differences revealed a quadratic relationship between submissiveness and English achievement when the female and rural subgroups were considered separately. The male subgroup showed a linear relationship between English achievement and tender-mindedness. None of the subgroups classified by sex, rural-urban or matriculation—non-matriculation differences show any major deviation from the general patterns. In particular, there is no connection between total neuroticism score and overall academic attainment.

Plausible explanations can be put forward *ex post facto* for the two significant relationships discovered. The explanation favoured is that the *interests* of the tender-minded individual, in contrast to those of the tough-minded individual, is the determining factor, explaining the linear relationship between tender-mindedness and English. The artistic, reading interests of the tender-minded Canadian students contrast with the more rugged athletic and physical interests of the tough-minded Canadian students. Familiarity with the forms and structures of the English language is a prerequisite for success on the test of English achievement whereas it is doubtful that the transfer value of extracurricular reading is so great in subjects such as science, mathematics, and social studies where factual knowledge is being tested.

The curvilinear relationship between English and submissiveness is somewhat more difficult to explain. The strong need for social approval and a disposition to accept rather than to refute—presumably characteristic of the submissive individual coupled with a rather passive orientation, similar to that of the tender-minded individual, may explain the high scores of the E+ (submissive) students on the English achievement test. The difficulty arises from the fact that the more dominant (E-) students also performed well on the Stanford English test. Reference to Table 1 will verify a tendency for the Stanford achievement scores to be correlated negatively with submissiveness. Dominance is positively related to most achievement scores. This general relationship seems to hold with regard to English achievement as well (at least at the dominant end of the submissiveness-dominance scale).

In view of the possibility that *very high* achievers might be more neurotic than the average run of students, a final series of one-way analyses was carried out comparing the scores (on the five personality variables) of the top 5% (chosen on the basis of overall achievement scores) with the remaining 95% of students. The only significant result was that the high achievers appeared to be less submissive ($p < .03$) than the remaining students.

Two-way analyses of variance were carried out on the variables by

sex, rural-urban, or matriculation—non-matriculation differences. The results were very similar to those commonly found. Females scored higher than males on tender-mindedness, submissiveness, and total neurotic level. Males scored higher than females in science and social studies achievement. Matriculation students scored higher than non-matriculation students on all of the achievement variables. There were no significant differences between rural and urban subgroups, and there were no significant interaction effects.

IV. Discussion and Conclusion

With respect to the four hypotheses which the present study was designed to test these conclusions can be drawn:

1. For this sample of Canadian high school students the personality dimension of neuroticism-stability is not related in any way to overall academic attainment.
2. Since no relationship was found, it is not possible to speak of it as being linear or curvilinear.
3. Neuroticism is not related to academic attainment for any of the subgroups formed on the basis of differences in sex, rural-urban or matriculation—non-matriculation differences.
4. No relationships were found between any of the neurotic (*NSQ*) sub-variables and overall academic attainment as measured by the Stanford tests.

However, whilst there was no relationship between overall academic attainment and any of the *NSQ* variables, interesting relationships were found between specific achievement tests and *NSQ* variables. Submissiveness and English achievement, and tender-mindedness and English achievement, were found to be related. However, these relationships have no bearing on the main problem which the study hoped to achieve: that by working with specific neurotic sub-variables and relating these separately to achievement, it might be possible to explain the ambiguities and contradictions in the literature devoted to this problem.

The failure of studies to produce uniform results in the shape of correlations between neuroticism and achievement may be associated with their relatively simplistic designs. It is becoming increasingly apparent that the relationship between neuroticism-stability and achievement is too complicated to be studied in this manner. Sex differences, ability differences, differences in educational programs and objectives, differences in educational levels, as well as differences in individual habit-structures act as confounding variables which inevitably obscure any direct relationship between personality and attainment which may exist (see Eysenck 1972). Until more extensive and more sophisticated studies are carried out, controlling the relevant variables mentioned above, the outcome of our efforts is likely to continue to be confusion and lack of replicability.

References

- Biggs, J. B., The Relation of Neuroticism of Extraversion to Intelligence and Educational Attainment. *British Journal of Educational Psychology*, 1962, 32, pp. 188-195.
- Butcher, H. J., Ainsworth, M. D., and Nesbitt, J. E., Personality Factors and School Achievement. A Comparison of British and American Children. *British Journal of Educational Psychology*, 1963, 33, pp. 276-285.
- Cattell, R. B., and Butcher, H. J., *The Prediction of Achievement and Creativity*, New York: Bobbs-Merrill Company, Inc., 1968.
- Cattell, R. B. and Scheier, I. H., *The Meaning and Measurement of Neuroticism and Anxiety*, New York: Ronald Press Company, 1961.
- Cattell, R. B. and Scheier, I. H., *Handbook for the Neuroticism Scale Questionnaire*, Champaign, Ill.: Inst. of Pers. and Abil. Testing, 1961.
- Cattell, R. B., Sweney, A. B., and Sealy, A. P., An Appraisal of Personality and Motivation Factors in the Prediction of School Achievement. *British Journal of Educational Psychology*, 1966, 36, pp. 280-295, 280-295.
- Child, D., The Relationships Between Introversion-Extraversion, Neuroticism and Performance in School Examinations. *British Journal of Educational Psychology*, 1964, 34, pp. 187-195.
- Entwhistle, N. J. and Shirley Cunningham, Neuroticism and School Attainment—a Linear Relationship? *British Journal of Educational Psychology*, 1968, 38, pp. 123-132.
- Eysenck, H. J., Personality and Attainment: An Application of Psychological Principles to Educational Objectives. *Higher Education*, 1972, 1, pp. 39-53.
- Furneaux, W., *Report to Imperial College of Science and Technology*, 1956.
- Furneaux, W. D., The Psychologist and the University, *Univ. Quart.* 1962, 17, pp. 33-47.
- Gardner, E. F., Merwin, J. C., Callis, R., and Madden, R., *Stanford Achievement Test—High School Battery; Manual*, New York: Harcourt, Brace and World Inc., 1965.
- Kelvin, R., Luca, C., and Ouija, A. The Relationship Between Personality, Mental Health, and Academic Performance in University Students. *British Journal Social Clinical Psychology*, 1965, 4, pp. 244-253.
- Lynn, R., Temperamental Characteristics Related to Disparity of Attainment in Reading and Arithmetic. *British Journal of Educational Psychology*, 1957, 27, pp. 62-68.
- Lynn, R., Personality Factors Related to Academic Achievement, *British Journal of Educational Psychology*, 1959, 29, pp. 213-217.
- Lynn, R. and Gordon, I. E., The Relations of Neuroticism and Extraversion to Intelligence and Education Attainment. *British Journal of Educational Psychology*, 1961, 31, pp. 194-203.
- Rushton, J., The Relationship Between Personality Characteristics and Scholastic Success in 11-year-old Children. *British Journal of Educational Psychology*, 1966, 36, pp. 178-184.
- Warburton, F. W. and Hadley, S. T., *The Prediction of Achievement in Teacher-Training Courses of College Students Studying to be Teachers*, Ipat Bulletin No. 4, Laboratory of Personality Assessment: University of Illinois, 1960.

MARLENE MACKIE

The University of Calgary

School Teachers: The Popular Image

This paper describes the content of the stereotypes of school teachers and explores the relationship between the occupation's prestige and its public image. Stereotypes were collected from 590 Ss located in 25 organizations by means of a semantic differential and an open-ended questionnaire. The results serve to dispel the assumption that the teachers' image is a derogatory one. However, contrary to Thielbar and Feldman (1969), the stereotype provides few clues to the public's rationale for its evaluation of the profession.

In urban societies marked by episodic encounters, occupational stereotypes play an important role in everyday behavior. Very often, people are more interested in discovering a stranger's work than his name. This key piece of biographical information provides a fairly accurate assessment of the other's education, income, and life-style. In turn, familiarity with traditional occupational imagery shapes an incumbent's expectations of his reception in the community. Over time, stereotypes may interact with the objective demands of the work situation to condition the occupational role itself (Caplow, 1954). Popular impressions certainly affect both the numbers and types of persons recruited into the occupation.

Despite the practical and theoretical implications of stereotypes, students of work have concentrated on measurement of the differential prestige accorded occupations. The latter problem has been approached in two ways. The subjective technique establishes an occupation's social standing from public evaluations of the relative prestige of job titles. The objective method, on the other hand, ranks occupations from indices based on educational and income levels of their incumbents. Although there is a high correlation between subjective and objective rankings (Reiss, 1961, pp. 124-125; Pineo & Porter, 1967, p. 34), which suggests that laymen also use a job's monetary rewards and educational prerequisites in conferring prestige, a particular occupation may fare less well in the prestige hierarchy than it does in the objective rating. Teaching is one such occupation.

In the first national study of occupational prestige in Canada, Pineo and Porter (1967) asked respondents to place 204 job titles into a 9-position "ladder" of social standing. Transformed mean scores ranged theoretically

from 0 to 100. High school and public grade school teachers received ratings of 66.1 and 59.6 respectively. The score differences from the lawyers' score of 82.3 were 16.2 and 22.7. This discrepancy was considerably greater than that which emerged from Blishen's (1967) objective assessment of the same two occupations: lawyers 75.4, teachers 70.1, for a difference of 5.3 points. Thielbar and Feldman (1969) have suggested that an explanation for such slippage may lie in the public's beliefs about the occupation: "the stereotyping of occupations can be viewed as an intervening link between objective conditions and prestige assessment of occupations (p. 66)."

Information about laymen's impressions of school teachers should be of interest to practitioners of the profession as well as social scientists. Curiously enough, in the relative absence of data, the predictions made by both groups are laced with pessimism. In separate issues of *The A.T.A. Magazine*, Seymour (1963) told teachers that "if we are honest with ourselves, the pictures others have of us, our public image, is none too flattering (p. 22)" and Friesen (1970) said that "the image of the teaching profession needs to be humanized and personalized in a public way (p. 13)." Caplow (1954) who spoke of the "unfavorable popular stereotypes which have attached for centuries to lawyers, physicians, dentists, teachers, and the clergy (p. 135)", explained that "Highly visible, moderately privileged, partially isolated, and responsible in the exercise of their authority for some of the major woes of their fellow men, professional men are logical targets for popular aggression (p. 135)." Hughes (1958, p. 24) and Mills (1956, p. xii) also believed that the public holds a derogatory image of teachers.

What is the specific nature of this unflattering stereotype? Foff (1958), the author of the one empirical study located, posed the question in this way: Are [teachers] esteemed by society as learned and devoted workers in the great tradition of Buddha, Socrates, and Aristotle? Or are they despised as rag-ends and tag-ends of the failure belt of unsalable males and unmarriageable females? Henry Adams eloquently wrote that "A parent gives life, but as parent, gives no more. A murderer takes life, but his deed stops there. A teacher affects eternity; he can never tell where his influence stops." The disgruntled sixth grader simply says, "Teachers stink." Caught between such warring images, the teacher desperately asks not "Who am I?" but "Who do they think I am?" (p. 118).

Foff's (1958) content analysis of 62 American novels found teachers to be depicted as mostly female, unattractive, sexless, and mediocre citizens, who were expected to behave just as their grandparents had. Beyond brief allusions to old maid school teachers and teachers as moral exemplars to the community, the literature offers no further help. No one seems to have measured variation in the stereotype by age, sex, or social class. This study attempts to provide some answers about the content of school teachers' public image and the relationship between the occupation's stereotype and its social standing.

Method

Subjects

Occupational imagery was collected from 590 Ss located in 25 Edmonton, Alberta organizations which were chosen to assure coverage of age,

sex, and social class ranges. The groups included a labor union, a motorcycle club, nursing students, the clerical employees of a bureaucratic organization, a senior citizens' recreation club, a Canadian Legion group, a women's lodge, several men's service clubs, and five community league groups chosen from various socioeconomic areas of the city.

Instruments

A stereotype refers to consensual folk beliefs about the characteristics of a social category. Although this definition omits reference to stereotype inaccuracy (Mackie, 1971), it otherwise conforms to decades of academic usage (Vinacke, 1957).

Two indicators of stereotyping were used, an open-ended questionnaire and a semantic differential. The instruments were randomly distributed in such a way that half the Ss from each organization received each instrument. Although this report is confined to impressions of teachers and lawyers (as a comparison group), Ss were presented with nine ethnic and nonethnic stimulus groups in randomized order. Both instruments required Ss to respond to the following statement: "School teachers (etc.) in general tend to be:".

The open-ended questionnaire asked Ss to write down as many things as they could think of to describe each category which was listed at the top of an otherwise blank page. They were encouraged to make 10 statements. A content analysis was done of the 300 sets of free verbal descriptions so generated by two coders. Inter-rater reliability was measured as the proportion of coding responses upon which the raters agreed out of the total coding responses (agreement plus error). A base of 100 was used to standardize the measure. At the end of the training stage, inter-rater agreement was .83. The reliability calculated midway through the task was .89, and at the end, .79.

For the purpose of this analysis, traits mentioned by 10% or more of the Ss are considered part of the stereotype. While this low cut-off point does not reflect a literal interpretation of the term "consensus", it is a pragmatic result of the difference between spontaneously producing a description and recognizing the appropriateness of one provided.

The semantic differential required Ss to rate the same stimulus groups described by the open-ended respondents on the following set of 14 seven-point bipolar adjectival scales: materialistic-not materialistic, ambitious-unambitious, naive-shrewd in dealing with other groups, contributing-a burden upon the community, disliked-liked by other groups, drunken-sober, sexually moral-immoral, mentally healthy-ill, lazy-hardworking, seldom-often in trouble with the law, not educated-educated, frivolous-thrifty with money, physically clean-dirty, characterized by unstable-stable marriages. (Fifteen additional scales which proved irrelevant for description of occupational groups have been omitted from this report.) The direction of scale polarity was varied according to a randomly designed pattern. For convenience, the scale positions were afterwards labelled from "1" to "7", the first position in each case being the socially desirable pole.

A stereotype is operationally defined as those attributes for which consensuality existed in extreme (non-neutral) scale positions (Gardner,

Wonnacott & Taylor, 1968). More specifically, scales with mean values of between 1.0 and 2.5, and between 5.5 and 7.0 are considered part of the stereotype, provided that the average deviation is less than 1.5.

Results

Total Sample Stereotypes

Table 1 compares the semantic differential image of teachers and lawyers. In the work sphere, incumbents of both occupations were viewed as differentially educated, hardworking, and ambitious. A partial explanation for the greater prestige accorded lawyers may lie in the statistically significant differences in the public's attribution of these traits. However, the relationship between beliefs and social standing becomes less clearcut when teachers and lawyers are compared in terms of the scale "contributing to the community." Hodge, Siegel, and Rossi (1964, p. 294) state that the public uses functional importance of occupations as one criterion in according prestige. Yet, this sample did not distinguish between the functional necessity of teachers and lawyers. Moreover, Wilensky (1964) says that professional status rests on commitment to professional norms which "dictate not only that the practitioner do technically competent, high-quality work, but also that he adheres to a service ideal—devotion to the client's interests more than personal or commercial profit should guide decisions when the two are in conflict (p. 140)." Table 1 shows that teachers were seen as significantly less materialistic and shrewd in their dealings with others than were lawyers. Finally, it is clear that teachers are still

TABLE 1
SEMANTIC DIFFERENTIAL IMAGE OF TEACHERS AND LAWYERS, N = 290

Trait	Teachers \bar{X}	Lawyers \bar{X}	t
Educated	1.54	1.19	4.90**
Clean	1.68	1.50	2.36*
Seldom trouble w/law	1.87	1.92	-0.40
Mentally healthy	2.14	2.00	1.56
Contributing to community	2.15	2.22	-0.53
Hardworking	2.42	1.97	4.65**
Ambitious	2.48	1.56	8.36**
Sober	2.68	2.98	-2.64**
Stable marriages	2.77	3.44	-1.65
Sexually moral	2.77	3.05	-2.25*
Liked by others	2.97	3.08	-0.76
Thrifty with money	3.11	3.42	-2.29*
Shrewd in dealing w/others	3.35	1.77	8.45**
Materialistic	5.29	6.07	-5.89**

Note: Since all traits shown with means < 2.50 and > 5.50 have average deviations of < 1.50, they are considered part of the stereotypes.

* p < .05, 2 tailed.

** p < .01, 2 tailed.

expected to be paragons of middle-class virtue. The relationship between decorum and prestige remains conjectural.

When Ss were permitted free description, Table 2 shows that the emphasis of occupational imagery shifts to include personality traits as well as task oriented characteristics. Nevertheless, some results do overlap with the semantic differential stereotype. Both teachers and lawyers were again described as educated, hardworking, and valuable to society. Differential assignment of intelligence, monetary rewards, materialism, and dishonesty reinforce the findings reported above. However, teachers' interpersonal relationships rather than their commitment to traditional values are salient. Although teachers were seen as more kindly than lawyers towards their "clients", they were also described as more unsympathetic, domineering, and opinionated. These characteristics, plus the reference to undue pride, suggest that Caplow (1954) is correct in saying that laymen resent the power wielded by all professionals. The greater attribution of these traits to teachers may be in part a function of the non-voluntary association of teachers and pupils. In other words, students cannot exercise the same freedom of choice in approaching a teacher as clients can in asking for

TABLE 2

OPEN-ENDED QUESTIONNAIRE IMAGE OF TEACHERS AND LAWYERS, N = 300

Trait	Teachers %	Lawyers %	χ^2
Sympathetic-supportive towards pupils-clients	37.3	17.3	30.22**
Dominates others	26.3	12.3	18.84**
Competent work habits	17.7	17.3	0.01
Proud-egocentric	12.3	16.7	2.26
Educated	12.0	18.0	4.24*
Unsympathetic-destructive towards pupils-clients	11.7	8.3	1.84
Intelligent	11.7	24.0	15.58**
Intellectual interests	11.7	7.3	3.28
Hardworking	10.7	9.3	0.30
Well paid	9.3	45.3	97.88**
Contribute to community	9.3	11.7	0.88
Opinionated	8.0	2.7	8.46**
Honest-moral	7.9	10.0	0.73
Materialistic motives	6.0	12.0	6.60*
Articulate	5.7	12.0	7.48**
Physically unattractive	2.3	—	—
Female occupation	2.0	—	—
Dishonest-immoral	1.0	10.7	25.50**
Refusal to stereotype	6.0	6.6	—

Note: All trait frequencies above 10.0% are considered part of the stereotypes.

* p < .05, 2 tailed.

** p < .01, 2 tailed.

help from lawyers, doctors, etc. Although this logic may be tenuous, Hall (1964, p. 226) does mention this peculiar teacher-client relationship as one barrier to professional status, i.e. prestige. An additional hindrance to occupational prestige noted by Hall (1964) and Caplow (1954), namely devaluation of occupations which have traditionally been preserves of women, lacked importance for this sample. Lastly, it is interesting that despite the depiction of Foff's (1958) novelists, only 2% of this sample remarked on physical appearance.

Stereotypes of Sex Subsamples

Tables 3 and 4 show only the semantic differential and open-ended traits which differed significantly by sex. Since we are told that girls find school more congenial than do boys, female members of the sample could be expected to regard teachers more favorably than males. Moreover, Reiss (1961, p. 184) reported that American women ranked some occupations, including teaching, with a large proportion of employed females higher than do men. The data show that although this expectation was correct, relatively few traits were differentially assigned by sex and the characteristics involve both socio-emotional and task spheres. The degree to which females perceive teachers as sympathetic persons is worth noting.

TABLE 3
SEMANTIC DIFFERENTIAL IMAGE OF TEACHERS, BY SEX

Trait	Males N = 105 \bar{X}	Females N = 185 \bar{X}	t
Contributing to community	2.40	2.01	2.09*
Hardworking	2.64	2.30	2.17*
Ambitious	2.91	2.24	3.53**
Shrewd in dealing w/others	3.73	3.14	2.76**

* $p < .05$, 2 tailed.

** $p < .01$, 2 tailed.

TABLE 4
OPEN-ENDED IMAGE OF TEACHERS, BY SEX

Trait	Males N = 117 %	Females N = 183 %	χ^2
Sympathetic-supportive toward pupils	18.8	49.2	28.20**
Competent work habits	12.0	21.3	4.33*

* $p < .05$, 2 tailed.

** $p < .01$, 2 tailed.

Controls for age and SES affected neither this relationship nor the non-significant attribution of unsympathetic-destructive by sex.

Stereotypes of Age Subsamples

Table 5 lists semantic differential traits which differed significantly by age. The middle age categories viewed teachers as less materialistic than the other two categories. In general, the notion that teachers are model citizens increases with age. The open-ended questionnaire findings (Table 6) indicate that personal relationships with teachers particularly concerned the young people who have been most recently exposed to intimate contact with them. (An American study of occupational prestige [Reiss, 1961, p. 187] found teaching to be one of only three occupations that young persons rated substantially lower than did older persons.) Competency and intellectual proclivities carried greater interest for the 50+ group.

TABLE 5
SEMANTIC DIFFERENTIAL IMAGE OF TEACHERS, BY AGE

Trait	(1) 15-24 N = 138 \bar{X}	(2) 25-49 N = 119 \bar{X}	(3) 50+ N = 33 \bar{X}	(1) & (2) t	(1) & (3) t	(2) & (3) t
Materialistic	5.49	5.02	5.48	2.17*	0.00	-1.38
Sober	2.88	2.57	2.24	1.94*	2.49*	1.22
Seldom trouble w/law	2.07	1.70	1.67	2.92**	1.81	0.14
Stable marriages	3.09	2.55	2.24	3.08**	3.11**	1.08
Hardworking	2.50	2.45	2.00	0.30	2.54**	2.12*
Thrifty	3.30	3.10	2.36	1.11	3.56**	2.68**
Clean	1.74	1.71	1.30	0.19	3.32**	2.66**

* $p < .05$, 2 tailed.

** $p < .01$, 2 tailed.

TABLE 6
OPEN-ENDED IMAGE OF TEACHERS, BY AGE

Trait	15-24 N = 131 %	25-49 N = 135 %	50+ N = 33 %	
Sympathetic-supportive	51.1	25.2	30.3	19.99**
Dominates others	38.9	14.1	27.3	21.19**
Competent work habits	15.3	16.3	33.3	6.09*
Unsympathetic-destructive	18.3	5.9	9.1	10.01**
Intellectual interests	12.2	8.1	24.2	6.57*

* $p < .05$, 2 tailed.

** $p < .01$, 2 tailed.

Stereotypes of SES Subsamples

In view of the controversy over the alleged class bias of the education system (see Rosenthal & Jacobson, 1968), it was disappointing when this study failed to establish much image variation by social class. Only three semantic differential traits (Table 7) differed significantly by SES, the finding of a negative relationship between ascription of materialistic motives and SES being the one interesting result. No significant differences emerged from the open-ended questionnaire.

TABLE 7
SEMANTIC DIFFERENTIAL IMAGE OF
TEACHERS, BY SOCIAL CLASS

TRAIT	(1) 60+ N=62 \bar{X}	(2) 40-59 N=104 \bar{X}	(3) 39- N=65 \bar{X}	(1)&(2) t	(1)&(3) t	(2)&(3) t
Materialistic	4.61	5.11	5.77	-1.76	-3.96**	-2.51**
Ambitious	2.77	2.68	2.20	0.38	2.27*	2.02*
Stable marriages	2.52	2.93	2.82	-1.97*	-1.20	0.49

Note: Blishen's (1967) socioeconomic index was used to classify the occupation of the breadwinner in each S's family. Scores of 60+ are regarded as upper-middle class, scores of 40-59.99 as lower-middle class, and scores of 39.99 and below as working class. Farmers are excluded from this analysis.

* $p < .05$, 2 tailed.

** $p < .01$, 2 tailed.

Although these nonresults may be a product of the instruments used, response set should operate to increase stereotypy by SES on the semantic differential and to decrease stereotypy by SES on the projective questionnaire. Further, 74% of a U.S. sample of poor people gave public school teachers an "excellent" or "good" rating, versus 71% of the middle-class Ss, and 70% of the prosperous Ss (Reiss, 1961, p. 205).

Discussion

The purpose of measuring the public's impressions of school teachers was twofold: (1) to replace speculation with empirical data, and (2) to discover whether the content of folk imagery offered some explanation for the discrepancy between Canadian teachers' objective ranking based on income and education (Blishen, 1967) and their lower position in the occupational prestige hierarchy (Pineo & Porter, 1967). Thielbar and Feldman (1969) had submitted that stereotypy serves as an intervening link between objective work conditions and prestige ratings.

On a descriptive level, the empirical data dispel the pessimistic assumption that the public regards teachers as unattractive, ineffectual people. Teachers were viewed as a hard-working, competent group. The older age categories remarked upon their circumspect behavior. Nearly 40% of the open-ended Ss mention the compassion and dedication of teachers towards those in their charge.

Although the slippage between teachers' position on objective and reputational indices indicates that the public takes into account factors other than practitioners' income and training, the stereotype was insensitive to several facets of the teaching situation which social scientists have considered relevant to professional status. Comparison between the images of teachers and lawyers showed that neither the functional importance of the work to society (Hodge et al., 1964) nor the altruistic service orientation of practitioners (Haug & Sussman, 1969; Wilensky, 1964) seem to be important. A preponderance of females is said to lower the status of an occupation (Caplow, 1954, pp. 230-247) but this factor had salience for only 2% of the sample. Both Hall (1964) and Wilensky (1964) have emphasized that status is withheld from salaried professionals locked into bureaucratic structures and subject to the authority of lay boards. Yet, a very few Ss mentioned teachers' lack of autonomy. Though Wilensky's (1964, pp. 148-149) suggestion, that the mystique attached to an occupation's technical expertise becomes diluted when it is grounded in a social science vocabulary familiar to everyone, seems sound, its application to teachers provoked no comment from this sample. Caplow (1954, p. 55) said that degree of control exercised over the behavior of others correlates highly with prestige rankings, and showed that more prestige accrues to occupations whose subordinates are high status adults (e.g. lawyers' clients) than those whose subordinates are low status people (e.g. students). Respondents made no reference to this factor.

A clue may lie in Ss' frequent reference to abrasive aspects of the teacher-student relationship. This relationship is unusual in the sense that the clientele does not seek out the teacher on those rare occasions when special competence is needed to resolve a problem (Hall, 1964). Extended, involuntary exposure to a power relationship may produce resentment in some segments of the population: this affects the esteem accorded teachers. That the belief that teachers adhere to superior standards of moral behavior should diminish their social position is possible, but unlikely.

Obviously, the relationship between an occupation's prestige and its stereotype is complex. One may contend either that the public is not consciously aware of its reasons for awarding or withholding prestige to an occupation (perhaps, because the deference due a job is normative or traditional) or that researchers have not gone about tapping this knowledge in the correct manner. Although neither position is unthinkable, the fact that students of work have neglected occupational imagery suggests that the latter argument be given preference.

References

- Blishen, B. R. A socio-economic index for occupations in Canada. *The Canadian Review of Sociology and Anthropology*, 1967, 4, 41-53.
- Caplow, T. *The sociology of work*. Minneapolis: University of Minnesota Press, 1954.
- Foff, A. Scholars and scapegoats. *The English Journal*, 1958, 47, 118-126.
- Friesen, J. W. All is not well in the teaching profession. *The A.T.A. Magazine*, 1970, 50, 12-14.

- Gardner, R. C., Wonnacott, E. J., & Taylor, D. M. Ethnic stereotypes: A factor analytic investigation. *Canadian Journal of Psychology*, 1968, 22, 35-44.
- Hall, O. The place of the professions in the urban community. In R. Laskin (Ed.), *Social problems: A Canadian profile*. New York: McGraw-Hill, 1964.
- Haug, M. R. & Sussman, M. B. Professionalism and the public. *Sociological Inquiry*, 1969, 39, 57-64.
- Hodge, R. W., Siegel, P. M., & Rossi, P. H. Occupational prestige in the United States, 1925-63. *American Journal of Sociology*, 70, 286-302.
- Hughes, E. C. *Men and their work*. New York: Free Press, 1958.
- Mackie, M. An explication of stereotypy. Paper presented at the meeting of the Canadian Sociology and Anthropology Association, St. John's, Newfoundland, June 1971.
- Mills, C. W. *White collar*. New York: Oxford University Press, 1956.
- Osgood, C. E., Suci, G. J., & Tannenbaum, P. H. *The measurement of meaning*. Urbana: University of Illinois Press, 1958.
- Pineo, P. C. & Porter, J. Occupational prestige in Canada. *The Canadian Review of Sociology and Anthropology*, 1967, 4, 24-40.
- Reiss, A. J. *Occupations and social status*. New York: Free Press, 1961.
- Rosenthal, R. & Jacobson, L. *Pygmalion in the classroom*. New York: Holt, Rinehart, and Winston, 1968.
- Seymour, F. J. C. What is professionalism? *The A.T.A. Magazine*, 1963, 43, 20-23.
- Thielbar, G. & Feldman, S. D. Occupational stereotypes and prestige. *Social Forces*, 1969, 48, 64-72.
- Vinacke, W. E. Stereotypes as social concepts. *Journal of Social Psychology*, 1957, 46, 229-243.
- Wilensky, H. L. The professionalization of everyone? *American Journal of Sociology*, 1964, 70, 137-158.

GARY J. ANDERSON

Atlantic Institute of Education

and

HERBERT J. WALBERG

University of Illinois, Chicago

Class Size and the Social Environment of Learning: A Replication

Fourteen dimensions of the social climate of learning of high school classes were examined in their relationships to the size of the classes concerned. Two data samples included in the study were 149 classes participating in the 1967 evaluation of the Harvard Project Physics course and 61 classes in the Montreal Metropolitan area in a variety of subject content areas. Eight of the hypotheses supported by the Harvard data were again supported in the Montreal sample, though only two of the replications reached statistical significance. Cohesiveness and difficulty were negatively correlated with class size; that is, small classes are perceived as more difficult and more cohesive. These two statistically significant replications as well as the six non-significant replications were examined in their relationship to a number of paradigms for study of the effects of increasing class size on the social climate composition of the group. The study suggests a number of implications for replication work in general, as well as some specific findings relating to the climate of high school classes.

Although class size is of considerable interest to school administrators, parents, teachers and students, (particularly as it affects student-teacher ratio and teacher contract negotiations) its presumed effects even on traditional measures of educational quality have been difficult to detect. Class size does, however, affect student perceptions of their learning environment. Walberg (1969) has shown that, for physics classes at least, indicators of the social environment of learning were quite sensitive to variations in class size. Such class properties as cohesiveness, group satisfaction, formality, interpersonal friction among classmates and cliqueness within the class were found to bear both linear and curvilinear relationships with the size of the class. The present study is an attempt to replicate the prior results in a sample of classes in other subject areas. That is, the study attempts to examine the relationships

between class size and student perceptions of their classroom climate and compare these results to those of Walberg (1969). Replication studies are often difficult and are seldom attempted; yet, they must be done if results are to have any generalizability across settings and samples. Since the first study was published in Great Britain, the related research and theoretical rationale are reviewed briefly here.

McKeachie's (1963) review of research on size of *discussion* groups at the college level shows a mixed inconclusive pattern; he speculates that raising class size increases the group resources of knowledge and experience but decreases opportunities for exploiting individual contributions because communication problems arise, and some class members may feel restrained in large groups. Moreover, group dynamics research (Hare, 1962) has shown that leader dominance increases with group size and Stephan & Mishler (1952) found more instructor dominance in larger discussion classes. Thomas & Fink (1963) reviewed 31 studies of group size and performance, participation, interaction, organization, conformity, and satisfaction in a variety of organizations. In general, their review showed that group size was positively correlated with quality of performance and group productivity. With respect to participation, smaller groups appear to inhibit expression of disagreement and dissatisfaction but also tend to give each member more opportunities for interaction and leadership. Larger groups are generally found to be more rigidly organized, leading to less group cohesiveness and more division of labor, along with the rise of cliques and factions. Thomas & Fink also concluded that studies of small groups generally show negative correlations between size on the one hand and satisfaction and resistance to conformity on the other. Porter & Lawler (1966) reviewed a number of studies of group structure, attitudes, and behavior in industry and concluded that small work groups are characterized by higher individual satisfaction, lower absence rates, lower turnover and fewer labor disputes.

The earlier results for physics classes (Walberg, 1969) showed significant linear relationships between class size and four group characteristics: positively with Formality and Diversity and negatively with Cohesiveness and Difficulty. Curvilinear relationships between class size and Cohesiveness, Formality, Goal Direction, Disorganization and Diversity were also uncovered. (see Table 2 for a definition of these terms) Many of these empirical findings were explainable in terms of four paradigms for research on class size and the social climate of learning as illustrated in Figure 1.

The inspiration for the paradigms comes from the Getzels-Thelen (1960) socio-psychological framework and the 'possible intervening mechanisms' are derived from observations of classrooms, the review of relevant literature, and certain formulations of Indik (1965) on organizational structure and climate, and individual attitudes and behaviors. In the present study, no measures of the intervening mechanisms have been obtained; however, it was reasoned that if relationships between the independent and dependent variables could be established, measures of intervening variables might be obtained and analyzed in subsequent work.

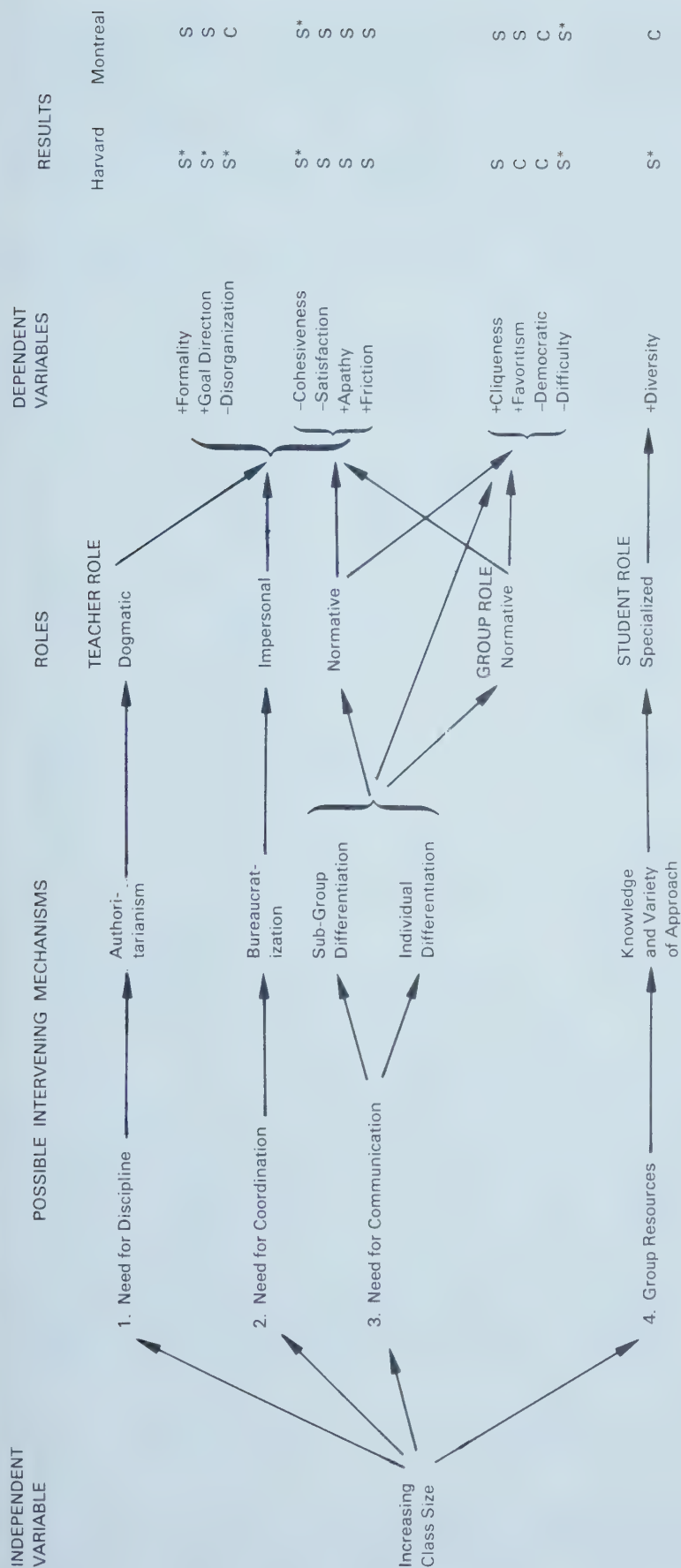


FIGURE 1
Paradigms for Research on Class Size and the Social Climate of Learning

Let us now examine the intervening mechanisms in Figure 1; namely the hypothesized needs for discipline, coordination and communication, and the pool of group resources. Through the eyes of William James (1899), the class is much like a battlefield. The opposing forces are the teacher and the pupils: the teacher strives for discipline and adult standards; the pupils strive for childish interests. When the pupils increase their forces, the teacher must change his tactics. When the class is large, the teacher may become more authoritarian, which leads to a dogmatic teacher role. The hypothesized effects are that the class is perceived by the pupils as more formal and goal directed with more apathy and friction and less disorganization, cohesiveness, and satisfaction.

The second mechanism stems from the analysis of the class as a social system (see Parsons, 1959; Getzels & Thelen, 1960). In the sociological tradition of Max Weber, modern social systems are seen as moving from 'collegial' and 'charismatic' organizational forms to 'bureaucratic' forms because of their increasing size and complexity. In school, there may be greater need for coordination of group efforts in large classes. The teacher may adopt an impersonal role, act uniformly towards individual students, and thus bring about conformity to the standards of the school. This teacher role would have the same effects as those hypothesized for the dogmatic teacher role as described in the preceding paragraph.

The third and fourth mechanisms are in the sociological tradition of Durkheim. As groups become larger, both the need of the individual for communication and the resources of the group increase. One possible consequence is that sub-groups, cliques, or factions arise with varying degrees of conformity to teacher or total group standards. The teacher may then control and reinforce behavior using normative sanctions; the total group may also influence subgroups in this fashion. Similarly, individual students may have less opportunity to communicate in a large class and have a greater need to exchange ideas and feelings with others. These students may initiate hidden, rival modes of communicating and behaving in class—active modes such as note-passing, 'grapevines', spitballs, leadership coups, and juntas or passive modes such as 'anomie', daydreaming, 'turning off'. The hypothesized effects on the social climate of the class would be greater 'cliqueness', favoritism, apathy, and friction, and less democracy, and less perceived difficulty with work due to the use of increased group resources to hide and protect the laggards. Lastly, large classes would have a greater range of student abilities and attitudes. The students may have more specialized roles such as monitor, 'brain', and 'clown' resulting as hypothesized class diversity.

Let us return to the substantive part of the study and examine the empirical relationships between class size and the classroom social climate.

Method

Sample

Walberg's (1969) sample included from throughout the United States 149 classes which participated in the research and evaluation activities of Harvard Project Physics during the academic year 1968-1969. The

replication data were obtained in mid-winter, 1970, from eight English-speaking secondary schools in the Montreal Metropolitan area. Classes were sampled randomly within schools, and represent the following areas of subject matter: six classes of physics, 10 of biology, 10 of chemistry, nine of mathematics, eight of English literature, 11 of history and seven of French. The pupils in Montreal ranged from 15 to 17 years of age and were in their tenth or eleventh year of school, whereas those in the physics group were typically a year older and in their eleventh or twelfth year of school. A comparison of the two samples is presented in Table 1.

TABLE 1
DESCRIPTION OF HARVARD PHYSICS AND MONTREAL SAMPLES

FREQUENCY DISTRIBUTIONS OF CLASS SIZES		
Class Size	Frequency (%)	
	Harvard	Montreal
6-10	3.4	4.9
10-13	8.7	9.8
14-17	14.8	6.6
18-21	17.5	23.0
22-25	20.8	27.8
26-29	22.8	18.1
30-33	6.0	8.2
34-37	4.7	1.6
28-41	1.3	0
Number of Students	3300	1550
Number of Classes	149	61
Mean Class Size	24.3	20.5
Standard Deviation	7.0	6.3

Instrument

Fourteen scales of the Learning Environment Inventory were used to describe the classroom climate as perceived by pupils along 14 dimensions that reflect the relationship of the pupils to one another, to the organizational properties of the class, to class activities and to the physical environment. Each of the Learning Environment Inventory scales contains seven statements descriptive of typical high school classes (see Table 2). The respondent expresses the extent of his agreement or disagreement with each item on a four-point scale. For each of the 14 dimensions, the mean response on the seven items is calculated and the mean of all student ratings in each class provides the estimate of the collective student perception of their classroom climate. Evidence for the validity of the instrument for predicting cognitive and affective learning for individuals and classes is presented in Anderson (1970) and Walberg and Anderson (1972). Measures of response consistency for individual respondents and for class mean ratings are shown in Table 2.

TABLE 2
LEARNING ENVIRONMENT INVENTORY SCALES

Scales	Sample Items	Reliabilities	
		Alpha	Intraclass
Cohesiveness	Members of the class are personal friends.	.69	.85
Diversity	The class divides its efforts among several purposes.	.53	.31
Formality	Students are asked to follow a complicated set of rules.	.76	.92
Speed	The class has difficulty keeping up with its assigned work.	.70	.81
Environment	The books and equipment students need or want are easily available to them in the classroom	.56	.81
Friction	Certain students are considered uncooperative.	.72	.83
Goal Direction	The objectives of the class are specific.	.85	.75
Favouritism	Only the good students are given special projects.	.78	.76
Difficulty	Students are constantly challenged.	.64	.78
Apathy	Members of the class do not care what the class does.	.82	.61
Democratic	Class decisions tend to be made by all the students.	.67	.67
Cliqueness	Certain students work only with their close friends.	.65	.71
Satisfaction	Students are well-satisfied with the work of the class.	.79	.84
Disorganization	The class is disorganized.	.82	.92

Note: Alpha coefficients were obtained from 1048 individual pupils while intraclass correlations for the reliability of class means are based on 64 classes. Reliabilities listed are for the Montreal sample, but do not differ substantially from those calculated using the Harvard data.

Procedure

In order to insure some measure of comparability of the results for the two samples, similar methods of analysis were used for both. Based on the results of the analysis of the data for physics classes, both linear and quadratic relationships were explored. However, as no cubic relationships were identified previously, the cubic terms were omitted in the Montreal analysis. For each learning environment scale, class size and its square were correlated in a step-wise fashion, testing first the correlation of the linear term and second, the combined linear and quadratic terms to determine whether or not the pair were significantly more predictive than the linear term alone (see Anderson, 1970, for the rationale behind the method).

Results and Discussion

The summary of results in Figure 1 suggests that eight of the hypotheses supported by the data for physics classes were again *supported* here, though only two of those replications reached the .05 level of statistical significance. One further hypothesis was contradicted in both instances, while three others exhibited mixed findings. Table 3 shows the same results in quantitative form.

The two replications of the linear terms reveal that Cohesiveness and Difficulty are negatively correlated with class size; that is small classes are perceived as more difficult and more cohesive. Finding for a second time that small classes are more cohesive indicates that conclusions of reviews of organizational research on size and morale perhaps also apply to school classes, in physics and in other subjects. That small classes are

TABLE 3
CLASS SIZE AND THE SOCIAL ENVIRONMENT OF LEARNING:
STEPWISE MULTIPLE REGRESSION ANALYSIS

Learning Environment Inventory Scale	Linear		Quadratic R		Overall F-ratio	
	Harvard Physics	Montreal	Harvard Physics	Montreal	Harvard Physics	Montreal
Cohesiveness	-.39***	-.26**	.47***	.39*	20.85***	4.64**
Friction	.11	.23	.16	.35*	1.95	3.60*
Cliqueness	.06	.08	.17	.11	2.14	.35
Satisfaction	.06	-.18	.10	.19	.79	1.01
Speed	-.08	-.07	.08	.07	.53	.15
Difficulty	-.21**	-.33**	.24	.39	4.52**	4.53**
Apathy	.07	.23	.15	.32	1.62	3.00
Favouritism	-.02	.20	.05	.24	.22	1.64
Formality	.24**	.13	.29*	.13	6.55***	.44
Goal Direction	.09	-.24	.29***	.24	6.43**	1.58
Democratic	.09	-.19	.10	.19	.79	1.03
Disorganization	-.12	.20	.24**	.21	4.46**	1.15
Diversity	.17*	-.19	.25*	.27	4.75**	2.05
Environment	.00	.00	.01	.27	.00	1.98

Note: The Quadratic R includes both linear and quadratic class size terms. Statistical tests for each predictor term pertain to the stepwise contribution of each term successively added to the regression model. Relationships designed with one, two, and three asterisks are statistically significant at the .05, .01, and .001 levels, respectively.

seen as more difficult may simply mean that students avoid or drop out of classes which acquire a reputation for difficulty. Or it may mean that teachers are able to get their way in “making it hard,” e.g., producing high task orientation, in small groups. We suspect that the small class provides much less opportunity for students psychologically to “drop-out”. In a sense, students in the small class are under constant scrutiny by the teacher and are also influenced by the work of their peers which is much more visible in a small class than in a large one.

Table 3 shows that only one of the five quadratic relationships identified

in the physics class data is found in the Montreal data. Indeed, the quadratic for Cohesiveness is reversed. The Harvard sample of physics classes was less and less cohesive in larger classes: the curve is concave upwards. The Montreal sample of classes of different subject matters have highest levels of cohesiveness from class sizes of from 10 to 20; classes larger than 20 are increasingly less cohesive, and the curve is concave downwards. The increasing amount of cohesiveness in large physics classes may be attributable to the use of small groupings of students for laboratory work. Also, the greater amount of cohesiveness in physics classes compared to other classes may result from the compensation in affiliation in the face of a relatively abstract and impersonal subject matter. Actually, the linear model is not a bad approximation to the data in each instance and such a model leads to more consistent findings across samples. It should also be noted that the largest class in the Montreal sample included 35 students, whereas two Harvard classes each contained more than 38 students. Cohesiveness scores for these two outlying physics classes were the lowest of any in the sample and no doubt affect the correlation considerably. It is not known whether or not the presence of similarly large classes in the Montreal sample would have changed these results. In short, whether two differing curvilinear models or a single linear model is most appropriate must await further study.

Returning to the paradigms in Figure 1, the intervening mechanisms may help clarify the findings. The nature of the first and second mechanisms may help explain the relative agreement in the two sets of results pertaining to these mechanisms. If increasing class size leads to teacher authoritarianism and bureaucratization in response to needs for discipline and coordination, then one would expect the observed results across subject areas. On the other hand, the suggested sub-group and individual differentiation resulting under the third mechanism may be more prevalent in physics than in other types of classes. Similarly, the differing results under the fourth mechanism may result from differing teacher and classroom organizational variables in different content areas. Further research should attempt to explore the precise nature and extent of the suggested intervening mechanisms in an effort more adequately to attribute the findings to differences in teacher behaviors in the various areas of course content, inadequacies in the paradigms, or simply measurement error.

One cautionary point. It might well be that other variables are creating a partially spurious correlation between size and group characteristics. A particularly attractive teacher, an interesting subject for study, or perhaps different pupil characteristics in classes of different sizes may be wholly or partially contributing to the observed relationships. It will take further replications under still different conditions, employing more stringent research designs before we can be at all certain.

What are the implications of these results for educational research? As has been pointed out recently by Smith (1970), very few studies in social science fulfill the necessary conditions for valid replication. Certainly, in the present study the samples are not perfectly comparable,

coming from different countries with a somewhat different distribution of class size and coming from entirely different subject matter areas. Yet, we would argue that the two samples are indeed sufficiently close to use for replication work. For, if educational research is to make any serious contribution to educational practice, the kind of findings uncovered must be sufficiently broad and general as to be applicable in a real educational setting. In other words, the findings from one group of studies using one particular sample, if worthwhile, should be relevant for somewhat different situations and somewhat different student groups.

Thus, with respect to the present study, eight supported relationships—two statistically significant—might not seem to be a great number, yet on the other hand to have even two supported in samples as different as those included here leads us to believe that these particular relationships may be sufficiently robust across samples to be applicable in a variety of settings. The replication of these two results, moreover, would seem to provide sufficient evidence to enable researchers to commence an experimental research phase: that is, to manipulate class size and observe in an experimental way the effects on both the cohesiveness of the group and students' perceptions of the difficulty level of the class.

In conclusion, replication studies are generally difficult and seldom attempted by researchers. But, if replication and generality cannot be established or is unpromising, then it will not be possible to apply findings from one setting to any other. We suspect that educational research in general will have to be "replicated" across all kinds of background variables before it can be very relevant. Also, consistency across samples will relate less to the extent to which the experimental conditions are duplicated than to the extent to which findings relate to established theoretical principles.

References

- Anderson, G. J. Effects of Classroom Social Climate on Individual Learning. *American Educational Research Journal*, 1970, 7, 135-152.
- Getzels, Jacob W. and Thelen Herbert A. The classroom as a unique social system. *National Society for the Study of Education Yearbook*, 1960, 59, 53-81.
- Hare, A. Paul. *Handbook of small group research*. New York: Free Press, 1962.
- Hemphill, John K. and Westie, C. M. The measurement of group dimensions. *Journal of Psychology*, 1950, 29, 345-342.
- Indik, Bernard P. Organization size and member participation: Some experimental tests of alternative explanations. *Human Relations*, 1965, 18, 339-350.
- Jackson, Philip W. and Guba, Egon G. The need structure of in-service teachers: An occupational analysis. *School Review*, 1957, 65, 176-192.
- James, William. *Talks to teachers on psychology and to students on some of life's ideals*. New York: Henry Holt, 1899.
- McKeachie, W. J. Research on teaching at the college and university level. In Gage, N. L. (Ed.). *Handbook of research on teaching*. Chicago: Rand McNally, 1963. Pp. 1118-1172.
- Parsons, Talcott. The school class as a social system: Some of its functions in American society. *Harvard Educational Review*, 1959, 29, 297-318.

- Porter, Lyman W. and Lawler, Edward E. Properties of organizational structure in relation to job attitudes and job behavior. *Psychological Bulletin*, 1963, 60, 371-384.
- Smith, N. C. Replication studies: A neglected aspect of psychological research. *American Psychologist*, 1970, 970-975.
- Stephan, F. F. and Mishler, E. G. The distribution of participation in small groups: An experimental approximation. *American Sociological Review*, 1952, 17, 598-608.
- Thomas, Edwin J. and Fink, Clinton F. Effects of group size. *Psychological Bulletin*, 1963, 60, 371-384.
- Walberg, H. J. Class size and the social environment of learning. *Human Relations*, 1969, 22, 465-475.
- Walberg, Herbert J. Predicting class learning: An approach to the class as a social system. *American Educational Research Journal*, 1969, 6, 529-542.
- Walberg, Herbert J., and Anderson, Gary J. Properties of the achieving urban classes. *Journal of Educational Psychology*, 1972, 381-385.

ZENA VIGOD

The University of New Brunswick

The Relationship Between Occupational Choice and Parental Occupation

The present research seeks, first of all, to determine whether a relationship between socio-economic status and occupational choice is found among young children (ages 5-16), and secondly, at which age this relationship asserts itself. In examining occupational choice, this study introduces a consideration of a 'wished' occupational choice and an 'expected' occupational choice. Findings indicate that parental socio-economic status is more highly correlated with child's 'expected' occupation than with his 'wished' occupation. Further, correlations between socio-economic status and occupational choices are found to be much smaller among the girls than among the boys, pointing to the differential impact of socio-economic status upon the sexes.

The problem under investigation is the relationship between family socio-economic status and child's occupational choice. The purpose of this inquiry is to find out if a child's choice of vocation is conditioned by the class culture in which he is reared.

Previous research in this area has largely focussed on older youth, adolescents between the ages of twelve and seventeen. For example, Hollingshead (1949) found that adolescents tend to choose occupations with which they are familiar because their parents and parents' friends are in them. E. Grant Youmans (1956) in his survey of Twelfth Grade Michigan boys discovered a substantial and statistically significant association between social stratification and occupational expectations of the boys. Further, Sewell, Haller and Straus (1957) found that levels of educational and occupational aspirations of youth of both sexes are directly associated with social status of their families when the effects of intelligence are controlled. Again, this study was restricted to older youth. They restricted their sample to adolescents because they claim fantasy aspirations play a great part in the younger child's occupational choice. However, these authors do not explain what they mean by fantasy or to what extent fantasy influences occupational choice among younger children.

Thus, the purpose of this study is to investigate whether socio-economic status is related to occupational choice among young children. In a society where social status is a result of one's occupational achievement, family socialization practices in regard to occupational aspiration are extremely important. Since the child is very early subjected to socialization practices, these may have an effect on the young child's perceptions and hence influence his occupational choice.

The numerous studies of social class differences in child rearing practices generally emphasize that upper and middle class families have socialization practices that reflect hopes for their children's future social and occupational success. Lower class practices do not effectively train for occupational success (Barber, 1957). One study done by Aberle and Naegele (1952) investigated the expectations of middle class fathers for their sons, and found that the fathers wanted their sons to have college training. The striking aspect of this study is that the age range of the children whose fathers were interviewed was from a few months old to thirteen years old. The fathers, making evaluative comments about the behaviour of even very young children is an indication of how early parents' generalized expectations for their children may come into play. Thus, of interest for this study is the age at which a relationship between socio-economic status and child's occupational choice asserts itself.

In considering the relationship between socio-economic status and occupational choice, we need to clarify what we mean by occupational choice. We can distinguish between a fantasy choice and a realistic choice. According to Ginzberg (1951), a fantasy choice refers to a choice that does not take into consideration the barriers which may stand in the way of achieving an occupation. It is a choice of an occupation which permits an activity that seems attractive at the moment. It refers to what a person desires or wishes to be if he could be anything he wanted. A realistic choice is a choice of an occupation that a person considers possible or appropriate for him. It is what a person expects he will probably end up doing. It would appear, therefore, that in considering the relationship between a child's socio-economic status and his 'wished' and 'expected' occupational choices, what a child expects he will probably end up doing will be more closely related to parental socio-economic status than what a child wishes to be if he could be anything he wanted. This is pointed out in Stephenson's (1957) survey of 1000 Ninth Graders. He found that although aspirations (fantasy) are relatively unaffected by class, plans or (real) expectations are more definitely class based. His study showed that while children whose parents were in lower classes aspired to high occupational positions, their plans were more closely related to their father's occupation. Of concern to this study is whether a discrepancy between a 'wished' occupation and an 'expected' occupation asserts itself among young children and whether this discrepancy is related to socio-economic status.

A final consideration is with the effect of age on occupational choice. With increase in age, a child becomes more socialized and the influence of parental socio-economic status on the child's occupational choice should become more pronounced.

On the basis of the above consideration, the following hypotheses were suggested:

1. The higher the child's socio-economic status, the higher will be the status of the occupation chosen as 'expected' occupation.
2. The child's socio-economic status will be more highly correlated with the 'expected' occupational choice than with the 'wished' choice.
3. The higher the child's socio-economic status, the smaller the difference between the 'wished' occupational choice and the 'expected' choice.
4. With increase in age, the relationships in the above hypotheses will become more pronounced.

Method

Subject

The sample came from four schools located in the city of Fredericton, New Brunswick. The schools were selected to provide a range of socio-economic statuses as well as a range of ages. Accordingly, one elementary school (grade 1-7) and one junior high school (grades 8 and 9) were taken from a higher socio-economic district of the city while one elementary and one junior high school were selected from a lower socio-economic area of the city. One class, randomly chosen at each grade level, participated in the study. The age range of the respondents was from 5-16 years with a mean of 10.

Out of the 574 students who took part in the study, there were 298 boys and 276 girls. Fourteen boys and seventeen girls were dropped from the study due to insufficient information, that is, the child did not give a response, his answers were unclear and could not be assigned a score on the Blishen Socio-Economic Index for Occupations (1967), or information on father's present occupation was unavailable in cases where the father was deceased or parents were divorced or separated. A further reduction was made for the females due to the fact that 37 females responded 'housewife' for their occupational choice and this could not be assigned a Blishen score. These 37 cases were analyzed separately.

Measure Used To Test Hypotheses

Occupational choice was determined by asking the child two questions. The first question emphasized a wished or desired occupation, while the second inquired what the child expects he will probably end up doing. The responses to these questions were assigned a score according to the Blishen Socio-Economic Index for Occupations (1967). The child's socio-economic status was determined by each child's response to a question regarding the present occupation of his father. These responses were also assigned a score on the Blishen Socio-Economic Index for Occupations. The children's answers were found to be descriptive and informative. For example, a six year old boy in telling what his father does, said "Brings oil to houses"; a seven year old boy stated "My father works in a store where he sells doors and windows"; and another child indicated, "My father fixes cars". Where possible school records were consulted and found either to correspond or supplement the children's responses.

Procedure

Data were collected within a two week period. Boys and girls in each classroom were questioned as a group. Each answer was written on a separate card and handed in when completed. This procedure was used so that later questions would not result in changing preceding answers. The questions were asked in the following order: (1) "When you grow up, if you could choose any job you wanted, which job would you choose?" ('wished' occupational choice) (2) "What job do you think you will probably end up doing?" ('expected' occupational choice) (3) "What kind of job does your father have and where does he work?" The rationale behind this ordering is that the researcher did not want to direct the child's thinking towards his father's occupation before the other answers were completed. The younger children were given individual attention and assisted with the spelling of their answers.

Findings

The first hypothesis states that the higher the socio-economic status, the higher the occupation chosen as expected. For the boys, this hypothesis is confirmed. Table 1 indicates that the correlation between parental socio-economic status and boy's 'expected' choice is .74 ($p < .05$). As predicted, in the second hypothesis, the boy's socio-economic status is not as highly correlated with 'wished' occupation, $r = .32$ ($p < .05$). With regard to the third hypothesis, a high negative correlation would indicate that the higher the child's socio-economic status, the smaller the difference between the 'wished' and 'expected' occupational choices. Results for the boys show a correlation of $-.45$ ($p < .05$).

TABLE 1
CORRELATIONS BETWEEN SOCIO-ECONOMIC
STATUS AND CHILD'S OCCUPATIONAL CHOICES

No.		Correlations Between SES and 'wished' choice	Correlations Between SES and 'expected' choice	Correlations between SES and the discrepancy between 'wished' and 'expected' choices
Boys	284	.32*	.74*	-.45*
Girls	222	.09	.25*	-.17*

* $p < .05$

The same procedure is employed to analyze the data from the girls. For the girls, though socio-economic status is significantly correlated with 'expected' occupational choice, $r = .25$ ($p < .05$), this correlation is much smaller than among the boys. As predicted, socio-economic status is found to be more highly correlated with 'expected' choice than with 'wished' choice. The correlation between socio-economic status and 'wished' choice is .09, dropping below the .05 level of significance. Among the girls, an inverse relationship is also found between socio-economic status and

the discrepancy between the ‘wished’ and ‘expected’ occupational choices, $r = -.17$ ($p < .05$). Once again this relationship is not as pronounced as among the boys.

The 37 girls who responded ‘housewife’ for their occupational choice were analyzed separately. It is interesting to note that all but three responded ‘housewife’ to the ‘expected’ occupational choice, rather than to the ‘wished’ choice. These 37 responses were not characteristic of any particular age group or socio-economic status, but are found to be randomly distributed among the population.

To test the fourth hypothesis, that is, the effect of age, the sample population was divided into three parts as equal as possible; a young group consisting of ages 5-8; a middle group, ages 9-12; and an older group, ages 13-16.

TABLE 2
DIFFERENCES IN MAGNITUDE OF CORRELATIONS BETWEEN
SOCIO-ECONOMIC STATUS AND CHILD’S OCCUPATIONAL
CHOICES ACCORDING TO AGE GROUPINGS

Ages	No.	Correlations Between SES and ‘wished’ choice	Correlations Between SES and ‘expected’ choice	Correlations Between SES and the discrepancy between ‘wished’ and ‘expected’ choices
Boys				
5-8	82	.30*	.51*	-.13
9-12	91	.30*	.87*	-.64*
13-16	111	.36*	.80*	-.44*
Girls				
5-8	54	-.27*	.004	-.29*
9-12	82	.21*	.27*	-.06
13-16	86	.22*	.41*	-.18*

Table 2 suggests that in general, with increase in age, the correlations between socio-economic status and occupational choices become more pronounced. This is particularly noticeable with regard to socio-economic status and ‘expected’ occupational choice among the boys, where a correlation of .51 ($p < .05$) is found in the youngest age group and increases to .87 ($p < .05$) in the middle group. Though the correlation decreases slightly in the next highest group, i.e., $r = .80$ ($p < .05$), this decrease is minute. In all cases socio-economic status is more highly correlated with ‘expected’ than with ‘wished’ occupation. The correlation between socio-economic status and the difference between ‘wished’ and ‘expected’ choices is not significant for the youngest group (ages 5-8) but is significant for the other two groups.

Among the girls, the correlation between socio-economic status and ‘expected’ occupational choice for the youngest group falls below the .05

level of significance. The correlation progressively increases to .27 ($p < .05$) in the middle group and .41 ($p < .05$) in the oldest group. Once again, the 'expected' occupational choice is more highly correlated with socio-economic status than is the 'wished' occupation, all correlations being smaller than among the boys.

In order to discover at which age the relationship between socio-economic status and occupational choice asserts itself, correlations between these variables were computed for each age level.

TABLE 3
DIFFERENCES IN MAGNITUDE OF CORRELATIONS
BETWEEN SOCIO-ECONOMIC STATUS AND CHILD'S
OCCUPATIONAL CHOICES AT EACH AGE LEVEL

Ages	No.	Correlations Between SES and 'wished' choice	Correlation Between SES and 'expected' choice	Correlations Between SES and the discrepancy between 'wished' and 'expected' choices
Boys				
6	20	.32	.55	.05
7	30	.28	.55	-.36
8	27	.26	.33	.02
9	25	.27	.86	-.67
10	28	.28	.85	-.56
11	20	.36	.92	-.71
12	18	.33	.81	-.49
13	44	.35	.70	-.39
14	45	.43	.84	-.56
15	16	-.27	.89	-.73
Girls				
6	13	-.19	-.44	-.04
7	18	-.34	-.27	-.30
8	22	-.20	.25	-.44
9	28	.22	.33	-.13
10	17	.18	.18	.03
11	22	.42	.39	.07
12	15	.14	.31	-.31
13	31	.43	.31	.21
14	44	.03	.40	-.36
15	9	.23	.59	-.27

Table 3 points out, that for the boys, at age 6, the correlation between socio-economic status and 'expected' occupational choice is .55. At age 9, the correlation jumps to .86 and remains high varying only slightly up to age 15 where the correlation is .89.

For the girls, a negative correlation between socio-economic status and 'expected' occupational choice is found at age 6 and 7. At age 8, a

positive correlation asserts itself, i.e. $r = .25$ and progressively increases with minor deviations to a correlation of .59 at age 15.

Discussion

More than half the variance in boy's 'expected' occupational choice can be explained in terms of socio-economic status. This is compatible with the various studies that point to the impact of socio-economic status on the socialization process, which in turn influences the child's occupational choice. This study, in general, supports the prediction that young children are aware of the differences between 'wished' and 'expected' occupation.

Among the girls, only six percent of the variance in 'expected' occupational choice can be explained in terms of socio-economic status. One possible explanation for the weaker correlations among the girls, is that close to half of the girls from the various socio-economic backgrounds chose either to be a teacher, a nurse, or a secretary. In this sample, it appears that the girls' conceptions of possible job careers are limited.

There is a differential impact of socio-economic status on boys' and girls' occupational choices. That is, not only is the correlation between socio-economic status and occupational choice weaker for the girls, but the relationship asserts itself at a later age. This brings into question the nature of this impact. Does socio-economic status refer to the influence of a specific subcultural milieu or are children identifying with their fathers who have come to represent a role model for them? With the boys, the latter may be the case. The girls, on the other hand, do not identify as closely with their fathers and this may be a factor in accounting for the discrepancy between the male and female correlations. This study only inquired into father's occupation, but it would be of interest to find out if mother's occupation, if any, is related to the girl's occupational choice.

The response of 'housewife' among the girls (fourteen percent of the total population), as mentioned previously, is not characteristic of any particular age or status group but is randomly distributed among the sample population. Data from this single study are unable to explain this phenomenon. Further research needs to be done concentrating on those females who expect to work and those who do not. Making such a distinction might reveal more about the chosen category 'housewife'.

In conclusion, we may note that because of the high correlation between age and grade, i.e., $r = .97$ ($p < .05$), it is difficult to separate the effects of these variables empirically. Age may be taken as reflecting the influence of growing up in general, while grade, on the other hand, may refer more to the impact of school on the socialization of the child. This study, however, is unable to point to this distinction because age and grade were found to be so highly correlated.

References

- Aberle, D., Naegele, L. D. "Middle Class Fathers' Occupational Role and Attitude Toward Children." *American Journal of Anthropology*, 1952, 22.
- Barber, Bernard. *Social Stratification, A Comparative Analysis of Structure and Process*. New York: Harcourt, Brace & World Inc., 1957.
- Blishen, Bernard. "A Socio-Economic Index for Occupations in Canada." *Canadian Review of Sociology and Anthropology*, 1967, 4, 41-55.
- Ginzberg, E. *et al. Occupational Choice—An Approach to a General Theory*. New York: Columbia University Press, 1951.
- Hollingshead, August B. *Elmtown's Youth*. New York: John Wiley & Sons, 1949.
- Sewell, William H., Haller, Archie O., Straus, Murray A., "Social Status and Educational and Occupational Aspirations." *American Sociological Review*, 1957, 22, 67-73.
- Stephenson, Richard M. "Mobility Orientation and Stratification of 1000 Ninth Graders." *American Sociological Review*, 1957, 22, 204-211.
- Youmans, E. Grant. "Occupational Expectations of Twelfth Grade Michigan Boys." *The Journal of Experimental Education*, 1956, 24, 259-271.

JEAN-MARC LEMIRE

*Dept. of National Health
& Welfare, Ottawa*

Creativity and School: A Social Problem

The main purpose of this paper is to synthesize the various aspects of the relationship between students' creativity and the basic elements of the school system. The second purpose is to show some of the implications of such relationship for the functioning of society. These two purposes can be integrated within a single frame showing that the relation between creativity and school presents a social problem.

The problem implied in the functional relationship of creativity and the school system can be stated as a syllogism:

Premise 1. Certain basic characteristics of the school system do not favour the development of creative students and even discourage it.

Premise 2. Since the school system is a major means of accessibility to responsible and/or powerful social positions or occupations, then. . . .

Conclusion: Few persons in responsible and/or powerful social positions are as creative as they could be (if the school system was changed so as to admit or encourage creative talent). This conclusion also implies that fewer problems which require creative talent are being solved, and that society's efficiency of operation is less than maximum.

In the following, each premise as well as the conclusion is examined on the basis of available data. Despite the unavailability of survey data on the 'outputs' as well as on the quality of the school system (Baldwin, 1965; Cameron, 1959; Cohen, 1969; Enns, 1969, Keppel, 1966; Ingram, West, 1971), the exploratory and experimental data provided generally coincide and permit an image of the school system.

I. First Premise

This first premise refers essentially to the inconsistency between the characteristics of the school system and the characteristics of creative students.

A. Characteristics of the School System:

According to Johnson (1968), any educational program embraces four areas: goals, curriculum, instruction and evaluation. For the purpose of our demonstration, three of these four elements appear most relevant: Instruction, Curriculum and Evaluation.

(a) Instruction:

Since instruction essentially involves a relation between teacher and student, any reference to this relationship should include a consideration of the teacher's performance (Geer, 1968).

This relationship was particularly under scrutiny in the 20's and 30's when the so-called Progressive Education Movement criticized the various aspects of formal discipline in the classroom, the lack of interest in the student and the authoritarianism of the teachers (Cremin, 1961).

Unfortunately, according to some, reports in the 40's and 50's indicated that few changes had occurred. In 1958, Dr. Swift, Alberta Deputy Minister of Education, indicated that the school system was not being "shaped or significantly influenced, at least overtly enough to be readily observed, by any particular set of philosophical considerations" (Swift, 1958:30). Earlier, Prof. A. S. Mowat of Dalhousie stated that, in his view, the Canadian school system had been "little affected by Progressive Methods" when compared to the U.S.A. (Mowat, 1954:26). On the other hand, American studies of the 60's report very traditional attitudes towards the methods of instruction.

In his extensive review of the research literature on teachers' performance in classroom, Biddle (1969) concludes: "These observations point to a classroom that is 'traditional' in its orientations . . . the teacher of today has been little affected by a progressive ideology on the concepts of an activity-centered education". Bellack (1963) found that the direction of the relationship teacher-student was primarily from the teacher to the student and usually originated from the teacher. In a study of 41 elementary school teachers, Hughes (1959) concluded that: "Generally, classrooms are predominantly controlled by dominative teacher behavior". In a study of 100 social studies classrooms, Flanders (1959) found that: "The teacher tends to dominate interaction by the use of direct influence with a resultant reduction in student participation". Similar conclusions were reached by Pugh (1967:635) and Friedenberg (1963).

One might describe the present instructional practices as traditional and teacher-oriented, despite some trends towards the use of discovery methods (Johnson, 1968:140) which, as explained by Bruner (1961:20-22) and Taba (1963:310-315), emphasize the role of the student in his education.

(b) Curriculum:

During the Progressive Education era, the structure and the content of the curriculum were to be centered around the child and

the individual. The curriculum was to be set up on the basis of principles promoted by such people as Rousseau, Froebel, James, Dewey, etc. (Brubacher, 1966:286-294). However, under the criticisms of what appeared to be anarchy in the school system (Lower, 1956:12-13), lack of consideration for social needs (Wild, 1955) and lack of consideration for the logical structures of certain fields of knowledge (Bruner, 1951:17-32; Johnson, 1968:148), "a heightened interest, almost hysterical in some quarters, in the formal content of education" was noted by Swift (1958). For example, although the system of elective courses had won public acceptance in the U.S. (Cordasco, 1963:130) and in Canada (Putman, 1925:112-115), core subjects were still seen as a necessity (Conant, 1959:47). One might describe the curriculum of the last five years as semi-rigid (i.e., includes elective and core courses) and logical (versus psychological). However, referring to the patterns of curriculum in America for the last 20 years, Connell *et al.* (1962) characterized the most widespread form as pre-planned subject-matter and neglect of learners' interests and critical thinking. Parsons (1959), Schellenberg (1965) and Horton *et al.* (1955) also used similar terms to describe their observations.

(c) *Teacher's Grades:*

Until very recently, the grading and examination systems were very much interrelated. As illustrated by Brubacher (1966:376): "Written examinations were the gates between grades, and these gates swung open and shut in a scheme of annual promotions". Despite early criticisms (Eliot, 1898:151-176, 253-269) of a system which "suppressed rather than took account of individual differences", the intimate relationship between grades and marks was only eliminated in the 60's in Canada (Morrison, 1931:81; Johnson, 1968:107). The so-called "non-graded school" or "continuous progress" system was introduced in Saskatchewan only in 1964, in Quebec in 1965 and in New Brunswick in 1966 (Stevenson, 1970:490; Johnson, 1968:138). On the other hand, the medieval system of examination referred to as the "recitation" (Brubacher, 1966:188) has not undergone much change. Among the seven general Royal Commissions on Education of the 50's and 60's, only one (the Hall-Dennis Commission) made definite recommendations for the abolition of the contemporary examination system (Stevenson, 1970:484) at the elementary and secondary school levels. The characteristics of these examinations have been described in many instances.

Considering the examination process, Bloom (1956) clearly stated that: "The most cursory reading of the standardized tests available or of teacher-made tests would indicate [that] a tremendous emphasis is given in our schools to remembering or recall". Torrance (1962) found a similar characteristic of the examination system in his "survey sample of the status of high school objectives". On a 100 point scale, cognitive and memory objectives accounted for 76 points and convergent thinking (right attitude, right solu-

tion . . .) accounted for 18.7 points, leaving 5.3 points for evaluative (comparing, judging) and divergent thinking (independent, constructive). In view of these data, one might describe the present marking system as still emphasizing information storage and retrieval, i.e. memory, rather than emphasizing information manipulation, i.e. mental skills.

B. Characteristics of Creative Persons:

The emotional, personality and cognitive characteristics of so-called creative people have been investigated on various occasions during the last twenty years. Among these investigations, perhaps the most comprehensive are those of Torrance (1962), Guilford (1967), Wallach and Kogan (1965), Getzels and Jackson (1962), and Barron (1961). These studies characterize the mental abilities of the creative person as being: curiosity, originality, problem-solving, etc. They characterize the attitudes and/or personality traits as: humour, playfulness, lack of rigidity, relaxation, inventiveness, independence of judgement, personal complexity, self-assertion, need for personal mastery over experience, rejection of suppression as a mechanism for the control of impulse and rejection of regulations by others. Although the studies which attempted to differentiate the creative person on the basis of personality characteristics are often contradictory (Foster, 1968), there is a consensus in terms of his mental abilities (Guilford, 1967:137-170). In fact, the creative person is the one who scores the highest on the thought products referred to as "divergent production". Divergent production can, according to Guilford and Torrance, be subdivided into four major mental operations referred to as: fluency, flexibility, originality and elaboration. Fluency refers to the ready flow of ideas conceptualized in terms of units, relations and systems. Flexibility refers to the readiness to change the direction of information: this mental operation produces concepts of 'classes'. Originality refers to the readiness to modify information: this mental operation produces the concepts of 'transformation'. Finally, elaboration refers to filling out ideas with details: this produces concepts of 'implication'.

C. Inconsistency of the Creativity-School Relationship:

Given the above data, it is inferred that the amount of conformism stressed by both the teacher-student relationship and the curriculum pattern is incongruent with the creative student personality traits and, that the emphasis of the examination process on memory and cognitive abilities might unduly penalize the creative student. These conclusions have been well supported through the experiment reported by Hutchinson (1967:419-427). Using a sample of 256 students, he found that "in the typical seventh grade social studies classroom using current teaching practices, verbal responses of the students are found primarily in the cognitive-memory classification, and productive thinking is primarily convergent"; "modifying instructional procedures . . . so as to treat students as thinkers rather than only as learners, elicits a wider range of verbal responses" (divergent and evaluative thinking

categories) and “makes no difference in measured growth of the subject-matter knowledge between the current and experimental teaching practices . . . as . . . three of the four experimental groups [with modified instructions] not only showed no loss but actually showed greater growth than the control groups”. Hutchinson also reported that the students in the four experimental groups [compared with four control groups] showed a significant difference on four of the 10 measures of creativity, after the teachers and students were trained four days prior to the 15 days of experimental education, whereas the “control groups had no significant gains over the experimental groups”.

If the basic conditions of creativity are compared with the ‘normal’ conditions of the school system, it is apparent that they are in disagreement with each other. Reviewing the related literature, Alamsah (1967:305-313) reduced the necessary conditions of creativity to four types: Motivation; Self-limitation; Receptivity and Competence. The first two conditions appear to be in flagrant contradiction to the present system as they refer consecutively to a “pull” effect which proceeds from the environment and to the individual’s recognition of his talents and abilities and of his personal value system. In the above-described system, which is teacher-oriented and which emphasizes conformism and obedience, there is little to suggest that the system attempts to encourage the individual to create and to recognize his own ability through some kind of experience. The third condition is defined by Alamsah as openness to new ideas or viewpoints. In examining the school system one can hardly argue that it promotes new ideas, since it is in itself a quite rigid and closed system. The fourth condition described by Alamsah is perhaps the only one which is consistent with the creative student characteristics. Referred to as competence or knowledge or mastery of the tools for intellectual work, this condition certainly coincides with the curriculum characteristics of the school system. These inconsistencies between the creative student characteristics and the characteristics of the school system are further supported by the following finding. Pang’s (1968) socio-historical survey revealed that Davy, Newton, Darwin, Comte, Locke, Edison, Pasteur, Watson, Fermi, Curie, Faraday, Einstein, Hobbes, Linton, Durkheim, Poincaré, etc., either nurtured a strong antipathy toward the school system or performed poorly.

If we agree with Polya, Rossman and others (National Bureau of Economic Research, 1962) that interest and motivation are crucial factors of invention or of creativity, the present data on the numbers and nature of underachievers and of drop-outs in our schools should be viewed as an indication of the possibility of an incongruence between the school system and the creative student’s desires and aptitudes.

In 1960, Seeman (1960) reported that underachievers (under the average) were “significantly characterized and differentiated by the manifest needs for dominance (unwillingness to conform to the demands of the school situation) and for affiliation (greater interest and concern for social activity than for studies)”. After a review of the literature on this aspect, he concluded that one-third of students of

higher education can be considered "under-achievers". Recently, an analysis of drop-outs of the Edmonton Public Senior High Schools (Paterson, 1968) found that two of the three main reasons for dropping out were lack of interest in school work (17.8%) and attendance problems (11.7%). Only 4.9% indicated "academic difficulties" as a reason. The total number of drop-outs for the period studied, September through December 1967, was reported to be 930: the reasons given by the drop-outs were among 18 "suggested by the school". At a more advanced level, Harvie (1969) found, among a representative sample of university undergraduates (University of Alberta) and a representative sample of students from an institute of technology (Northern Alberta Institute of Technology) who dropped out in 1967-68, that "lack of interest in courses" was the most frequent reason mentioned and accounted for 23.7% of the cases. The total drop-out population that year was more than 1,000.

Despite this bleak view of the school system a general consideration should be kept in mind: *not all creative students are penalized or suffer from the school-creativity incongruency*. As was noted by Wallack and Kogan (1965), and Yamamoto and Chimbois (1966), the students with above average I.Q. tend to adapt well to the school situation. Nor is it the case that *all* the students who drop-out, or otherwise suffer a poor school experience, would necessarily function at a higher achievement or "creativity" level if school classrooms were organised differently. Evidence shows that many creative individuals succeed in satisfying the school system's requirements.

II. Second Premise

This premise refers essentially to the nature of the school system as a major means of accessibility to 'powerful' social occupations.

A series of changes in the societies of the 17th, 18th, and 19th centuries brought about a school system which became a means of access to 'significant' social positions. The 'scientific revolution', the 'industrial revolution' and the 'political revolution' are the main recognized elements of Western civilization which introduced an organized system of thought referred to as 'liberalism', which promoted the access of all classes of individuals to the same basic education (Bruun, Commager, 1954:428-444; Stavrianos, 1966:185-240). Graves (1913:1) summarizes this historical context as follows: "In the eighteenth century are found the climax of the rebellion against the arbitrary authority of church and state, and the period of extreme individualism".

Charity and philanthropic schools such as those promoted by the "Society for the Promotion of Christian Knowledge" in England, those promoted by the "Brothers of the Christian Doctrine" in France and those promoted by the "Society for the Propagation of the Gospel" in America, etc., had initiated, during the 16th and 17th centuries, a trend towards universal education which cumulated into a system of public schools by the 18th century (Boyd, 1932:297-300; Graves, 1913:295-306). In Canada, public schools were first introduced in Ontario in 1871 (Graves, 1913:312).

Many thinkers of the 17th and 18th centuries perceived the threatening impact of universal schooling on class structure and on the distribution of power and wealth. Mandeville, for example, stated that "to make the society happy and people easy under the meanest circumstances, it is requisite that great numbers of them should be ignorant as well as poor . . ." (Brubacher, 1966:85). Similarly, Diderot affirmed that rigorous high academic standards should be applied in order "to temper the ambition of parents who are desirous of withdrawing their children from the subordinate occupations which they themselves follow, and of having them educated for priesthood, medicine or law. Nothing is more fatal to society than this disdain of parents for their own calling and these senseless migrations from one state in life to another." (La Fontainerie, 1932:300).

Today, formal education is still a necessary prerequisite for admission to most of the more powerful social occupations. The finding by Warner and Abegglen (1955:140-141) that there is an inverse relationship between the educational attainments of executives in an industry and the rate of growth of that industry recently suggested to Lenski (1966:393) that educational achievement was considered a symbol of membership in a favored class whose members are more concerned with the advancement of their personal and class interests than with the firm involved. Eckland's survey (1965:735-746) shows that when father's occupation and student's intelligence were controlled, formal educational attainment explained the concentration of the graduates in high status jobs, while those who were not graduates were in low status and middle status occupations. Similarly, when Porter (1961:486, 492) defined the Canadian Economic Elite as consisting of 985 people "who could be considered the most influential industrial and commercial leaders in Canada", it was found that the majority (56%) had university education.

More recent data support the same conclusion. On the basis of longitudinal study findings, Sewell *et al.* (1970) concluded that educational status attainment appears to have a "substantial impact on early occupational status attainment". On the basis of 1968 data, Spaeth (1970) found that the strongest predictive academic variable to the prestige of the job held was attendance at graduate school. Blau and Duncan (1967:157) went even further when they concluded that "the proportion of men who experience some upward mobility increases steadily with education from a low of 12% for those reporting no schooling to a high of 76% for those who have gone beyond college". As Dreeben (1971:82-119) partly explained, because society becomes more industrialized and automated, a higher level of occupational specialization is needed and such skills can hardly be developed, at present, without the school system.

Whether it is competence gained through appropriate training or authority gained through the 'masses' conviction "that the performance of the occupational skill requires specialized education; that those who possess this education, in contrast to those who do not, deliver a superior service" (Greenwood, 1962:211-212), the fact remains that education is a key to social powers and privileges which, in addition, bring other powers and privileges (Nosow, Form, 1962:373-375).

III. Conclusion

If one accepts the two above premises, the conclusion seems obvious: many creative individuals who could hold responsible and powerful positions will not do so, due, in part, to the school system. The consequence of this fact, in the functioning of society, is apparent: fewer problems will be solved, or they will not be solved as creatively as they could be.

The necessity for the individual, as well as for society, to develop creative talent and to use it has been stressed in various ways in the last twenty years. After reviewing historical records, Torrance (1962) concluded that cultures had collapsed because of the failure to utilize "intelligent, imaginative methods for solving . . . problems". Similarly, Hagen (1962:30-35) concluded in his examination of social change through the centuries that as "technological advance requires doing new things, it requires also the creation of new economic, political and social organizations and relationships or the adaptation to new functions of old organizations and relationships". In regard to human relationships, Coleman explains ". . . in our work, in our relationships with other people, in our role as citizens, we must use our full intellectual capacities to analyze the problems we encounter and work out the best solutions. Indeed, even some of the problems for which we do have habitual solutions merit a more thoughtful approach than we gave them, for our habitual ways of seeing and doing things can be outmoded with changes in circumstances and in ourselves" (Coleman, 1960:377). In fact, research suggests that in order to solve the numerous problems presented daily through interpersonal behavior, the individual must use at least six types (units, classes, relations, systems, transformations, and implications) of creative abilities (Guilford *et al.*, 1968:155-164).

In discussing the nature of scientific discoveries, the notion of 'creativity' is stressed in more than one instance by natural scientists such as Carnap (1966) and Flanagan (1959), as well as by behavioral scientists such as MacIver (1942) and Kaplan (1964). They agree with Einstein and Infeld that "to raise new questions, new possibilities, to regard old problems from a new angle, requires creative imagination . . ." (Einstein, Infeld, 1938:95).

Concerned over the "changing demands of the society" and the "supply of talent", a U.S. Committee on the Identification of Talent was created in 1951, with its first aim being: the research on "non-academic" types of talented behavior (McLelland *et al.*, 1958). Later, in 1958, the Rockefeller Commission on Education frankly concluded: "It is tempting to treat the problem of highly trained manpower in terms of the specific shortages which occur from time to time. But the true difficulty lies deeper. It is not a shortage, now of engineers, now of economists, that lies at the root of the problem. *It is the constant pressure of an ever more complex society against the total creative capacity of its people*" (Rockefeller Brothers Fund, 1958).

Referring to a "crisis of intellectual poverty" and a "knowledge problem", Cohen (1969) and Clark (1969) emphasized the need to develop the creative talent and to revise the whole educational process in terms of individuality, mobility and flexibility. It is not simply a coincidence

that the recommendations of the Hall-Dennis Report on Education in Ontario (Hall, Dennis, 1968) included the following four points: (1) "Emphasize the creative nature of the learning process through methods of discovery, exploration, and inquiry" (Recommendation 19); (2) "Provide learning experiences which are pertinent to the personal needs and interests of the learner" (Recommendation 20); (3) "Provide learning experiences that permit students to use content as a tool for discovery and exploration (Recommendation 21); (4) "Develop skills in research, organization and deduction throughout the learning program" (Recommendation 22).

Similarly, the Parent Commission in Quebec (1963-66) recommended that "teaching was to aim at individualized instruction, overall development of the child, and the stimulation of creativity among the students" (Stevenson, 1970:476).

Formal education being a key to privileged social positions and to social power, it is crucial for society's functioning that the school system be modified so as to encourage those individuals with "divergent" mental abilities (creativity). This recommendation is suggested by various studies of the school system and by studies regarding the nature of social functioning.

References

- Alamsah, W. H. The conditions of creativity. *Journal of Creative Behavior*, 1967, 1(3).
- Anderson, R. M. A study of the classroom verbal training behavior of open-minded and closed-minded student teachers instructed in Flanders' interaction analysis. *Masters Thesis, The University of Alberta*, 1969.
- Baldwin, C. Naturalistic studies of classroom learning. *Review of Educational Research*, 1965, 35(2).
- Barron, F. *The Creative Person*. Berkeley: University of California, 1961.
- Bellack, A. *The Language of the Classroom*. New York: Institute of Psychological Research, Columbia University, 1963.
- Biddle, B. J. "Teacher roles." In R. L. Abel (ed.), *Encyclopedia of Educational Research*. London: MacMillan, 1969.
- Blau, P. M., and O. D. Duncan. *The American Occupational Structure*. New York: Wiley, 1967.
- Bloom, B. C. *Taxonomy of Educational Objectives*. New York: Longmans, 1956.
- Boyd, W. *The History of Western Education*. London: A. C. Black, 1932.
- Brubacher, J. S. *A History of the Problems of Education*. Toronto: McGraw-Hill, 1966.
- Bruner, J. S. "Personality dynamics and the process of perceiving." In R. R. Blake, and G. V. Ramsey (eds), *Perception: An Approach to Personality*. New York: Ronald, 1951.
- Bruner, J. S. *The Process of Education*. Cambridge: Harvard University Press, 1961.
- Bruun, G., and H. S. Commager. *Europe and America Since 1492*. Cambridge, Massachusetts: Riverside Press, 1954.
- Cameron, D. *Report of the Royal Commission on Education in Alberta*. Edmonton: Queen's Printer, 1959.
- Carnap, R. *Philosophical Foundations of Physics*. New York: Basic Books, 1966.
- Clark, J. W. On facing the crisis of intellectual poverty. *Journal of Creative Behavior*, 1969, 3(4).

- Cohen, W. Education and learning. In B. M. Gross (ed.), *Social Intelligence for America's Future*. Boston: Allyn and Bacon, 1969.
- Coleman, J. C. *Personality Dynamics and Effective Behavior*. Chicago: Scott, Foresman, 1960.
- Conant, J. B. *The American High School Today*. Toronto: McGraw-Hill, 1959.
- Connell, W. F., et al. *The Foundations of Education*. London: Cresset, 1962.
- Cordasco, F. *A Brief History of Education*. New Jersey: Littlefield Adams, 1963.
- Cremin, L. A. *The Transformation of the School*. New York: Knopf, 1961.
- Deutsch, K. W., et al. Conditions favoring major advances in social sciences. *Science*, 1971, 171.
- Dreeben, R. "American schooling: patterns and processes of stability and change." Pp. 82-119 in B. Barber, and A. Inkeles, (eds), *Stability and Social Change*. Boston: Little, Brown and Co., 1971.
- Eckland, B. Academic ability, higher education and occupational mobility. *American Sociological Review*, 1955, 30.
- Eckstein, A., and L. Infeld. *The Evolution of Physics*. New York: Simon, Schuster, 1938.
- Eliot, C. W. *Educational Reform*. New York: Century Crofts, 1898.
- Enns, F. *Some Areas of Needed Research in Education*. Paper presented to the Human Resources Research Council Symposium, Edmonton, Alberta, 1969.
- Flanagan, D. "Creativity in science." In P. S. Smith (ed), *Creativity*. New York: Hastings, 1959.
- Flanders, N. Teacher-pupil contacts and mental hygiene. *Journal of Social Issues* (15), 1959, 30-39.
- Foster, F. P. The human relationships of creative individuals. *Journal of Creative Behavior*, 1968, 2: 111-118.
- Geer, B. "Teaching." In D. L. Sills (ed), *International Encyclopedia of the Social Sciences*, Vol. 15. Toronto: Crowell, Collier-MacMillan, 1968.
- Getzels, J., and P. Jackson. *Creativity and Intelligence*. New York: Wiley, 1962.
- Graves, F. P. *A History of Education in Modern Times*. New York: MacMillan, 1913.
- Greenwood, E. "Attributes of a profession." In S. Nosow and W. H. Form (eds), *Man, Work and Society*. New York: Basic Books, 1962.
- Guilford, J. P. *The Nature of Human Intelligence*. Toronto: McGraw-Hill, 1967.
- Guilford, J. P., et al. Solving social problems creatively. *Journal of Creative Behavior*, 1968, 2(3).
- Hagen, E. *On the Theory of Social Change*. Illinois: Dorsey Press, 1962.
- Hall, J. E., and L. A. Dennis. *Living and Learning*. Toronto: Ontario Department of Education, 1968.
- Harvie, J. B. *Factors Associated with Student Withdrawals at the Post-Secondary Level*. Masters Thesis, The University of Alberta, 1969.
- Horton, P., and G. Leslie. *The Sociology of Social Problems*. New York: Appleton, 1955.
- Hughes, M. *Helping Students Understand Teaching*. Salt Lake City: University of Utah, 1959.
- Hutchinson, W. L. Creative and productive thinking in the classroom. *Journal of Creative Behavior*, 1967, 1(4).
- Ingram, E. J., and L. W. West. *A Review of Educational Opportunity in Alberta*, 1970. Edmonton: Human Resources Research Council, 1971.
- Johnson, F. H. *A Brief History of Canadian Education*. Toronto: McGraw-Hill, 1968.
- Johnson, M. "Definitions and models in curriculum theory." In E. C. Short and G. D. Marconit (eds), *Thought on Public School Curriculum*. Iowa: W. C. Brown, 1968.
- Kaplan, A. *The Conduct of Inquiry*. California: Chandler, 1964.

- Keppel, F. *The Necessary Revolution in American Education*. New York: Harper, 1966.
- La Fontainerie, F. *French Liberalism and Education in the 18th Century*. New York: McGraw-Hill, 1932.
- Lenski, G. E. *Power and Privilege*. Toronto: McGraw-Hill, 1966.
- Lower, A. R. "Education in a growing Canada." In Katz (ed), *Canadian Education Today*. Toronto: McGraw-Hill, 1956.
- MacIver, R. M. *Social Causation*. New York: Ginn, 1942.
- McClelland, D. C., et al. *Talent and Society*. New York: Van Nostrand, 1958.
- Morrison, H. C. *The Practice of Teaching in the Secondary School*. Chicago: University of Chicago Press, 1931.
- Mowat, A. S. "How progressive are progressives." *University of Toronto Quarterly*, 1954.
- National Bureau of Economic Research. *The Rate and Direction of Inventive Activity: Economic and Social Factors*. Princeton: Princeton University Press, 1962.
- Nosow, S., and W. H. Form. "Occupations and social power." In *Man, Work and Society*. New York: Basic Books, 1962.
- Orowan, E. Our universities and scientific creativity. *Bulletin of the Atomic Scientists*, 1959, 15(6).
- Pang, H. Undistinguished school experiences of distinguished persons. *Adolescence*, 1968, 3(11).
- Parent, B. *Report of the Royal Commission of Inquiry on Education in the Province of Quebec*. Vol. 5. Quebec: Queen's Printer, 1966.
- Parsons, T. The school class as a social system. *Harvard Educational Review*, 1959, 29(4).
- Paterson, J. G., and A. Nichols. *An Analysis of Dropouts from Edmonton Public High Schools, September 1, 1967 to March 31, 1968*. Mimeo, 1968.
- Porter, J. The economic elite and the social structure in Canada. In B. R. Blishen, et al. (eds), *Canadian Society*. Toronto: MacMillan, 1961.
- Pugh, J. An analysis of the characteristics of teaching and learning related to pupil-teacher ratio. *Dissertation Abstracts*, 1967, 27(a): 635.
- Putman, J. H., and G. M. Weir. *Survey of the School System*. Victoria: King's Printer, 1925.
- Rockefeller Brothers Fund Inc. *The Pursuit of Excellence—Education and the Future of America*. New York: Doubleday, 1958.
- Schellenberg, J. The class-hour economy. *Harvard Educational Review*, 1965, 35(2).
- Seeman, B. E. *A Study of Academic Underachievement among Education Students at The University of Alberta*. Masters Thesis, The University of Alberta, 1960.
- Sewell, W. H., et al. The educational and early occupational status attainment process: replication and revision. *American Sociological Review*, 1970, 35(6).
- Spaeth, J. L. Occupational attainment among male college graduates. *American Journal of Sociology*, 1970, 75(4).
- Stravrianos, L. S. *The World Since 1500*. New Jersey: Prentice-Hall, 1966.
- Stevenson, H. A. "Crisis and continuum: public education in the sixties." In J. D. Wilson, et al. (eds), *Canadian Education: A History*. Scarborough: Prentice-Hall, 1970.
- Swift, W. H. *Trends in Canadian Education*. Toronto: W. J. Gage, 1958.
- Taylor, E., et al. *Development of a Theory of Education from Psychological and other Research Findings*. U.S. Office of Education Research, Project 621, 1962.
- Torrance, E. P. *Guiding Creative Talent*. New Jersey: Prentice-Hall, 1962.
- Wallach, M., and N. Kogan. *Modes of Thinking in Young Children*. New York: Holt, 1965.

- Warner, W. L., and J. C. Abegglen. *Occupational Mobility in American Business and Industry, 1928-1952*. Minnesota: University of Minnesota, 1956.
- Wild, J. "Education and human society: a realistic view." *Modern Philosophies and Education. 54th Yearbook, Part 1. National Society for the Study of Education*. Chicago, 1955.
- Yamamoto, K., and M. Chimbois. Achievement, I.Q., and creative thinking in fifth grade children: a correlational study. *Merrill Palmer Quarterly*, 1966, 12(3).

JOHN McLEISH

The University of Alberta

The Soviet Conquest of Illiteracy

In the period 1917 to 1934, from being a country where almost ninety percent of the population consisted of illiterate peasants, the Soviet Union was transformed into an emerging industrialized society, where almost ninety percent had achieved literacy. This was the outcome of a massive campaign which involved millions of voluntary workers and a number of voluntary societies. The campaign and its effects are described in some detail, with special concern for organizational problems, the preparation of learning materials, the motivations of teachers and learners and for the raw statistics as given in official reports.

The 1897 census revealed the extent of illiteracy in Tsarist Russia.¹ Over the next twenty years the situation changed but little owing to the declared policy and practices of the Tsarist government. Official figures for 1905 establish that the Ministry for Popular Enlightenment maintained 782 Sunday and evening schools for adults with a total enrolment of 40,000. In addition, there were 549 voluntary schools which catered for 36,714 students. The Orthodox Church maintained 260 Sunday schools with an attendance of 28,048 adult illiterates. This meant that there was one adult school for approximately every 150,000 illiterates. The total expenditure on these schools was roughly about nine cents per student per annum.²

In 1914 there were 101,917 primary schools and 1,654 secondary schools in the whole of the Russian Empire, located almost exclusively in the towns. There were practically no schools at all for the children of peasants, nor for their parents—that is to say, for the vast bulk of the Russian population.³

The Bolshevik section of the Social Democratic Party inherited the strong interest in popular education which characterized all leading sections of the revolutionary movement. Lenin, his wife Krupskaya, Krzhizhanovski, Menzhinski, and many other leading Party workers taught in Sunday schools and evening schools at one time or another. But although many thousands of students were involved, these part-time efforts represented at best an attempt to irrigate the vast desert of Russian illiteracy with plates of alphabet soup.

One of the first acts of the Bolshevik government on assuming power was to set up, on 9 October, 1917, a State Commission concerned with Popular Enlightenment. This was under the chairmanship of Lunacharski. N. K. Krupskaya was in charge of out-of-school education (that is, work with illiterates and semi-literates) and of political education. She formulated the tasks of the literacy schools as follows:

It is essential to give the student not only the key to knowledge, but to show him the doors which can be opened with the help of this key. We must aim at widening the mental horizon of the student as well as giving him the techniques of literacy.⁴

Lenin put forward the slogan: 'Every cook must learn to govern the State'. But the first thing the cook must learn was the alphabet for, as Lenin also said, the illiterate person must stand for ever outside of politics.⁵ The education of illiterates was always seen by the Russian communists as a means towards personal emancipation. But, for them, personal development in the true sense necessarily included preparation for political life and for social action.

After the successful revolution, the whole Party was therefore organized for this basic task of eliminating illiteracy. From the beginning of the Revolution libraries were opened, workers' clubs, schools for illiterates, people's universities. Provision was made for the "cultural development of the armed forces". Unfortunately, statistics for 1917-18 are not available, it is therefore impossible to obtain a complete picture of the work accomplished in this earliest period. But the pages of two journals devoted to describing and organizing this work, *Narodnoye Prosveshcheniye* (Popular Enlightenment) and *Vneshkolnoye Obrazovaniye* (Out of School Education), attest to the scale and success of these efforts.

In March 1918 the Eighth Plenum of the Communist Party of the Soviet Union adopted its new programme. In the sphere of adult education the following needs were recognized:

Many and varied types of government aid for the self-taught workers and peasants in the construction of a network of extra-school institutions—libraries, adult schools, people's homes and universities, courses, lectures, cinemas, etc. . . . The development of the widest propaganda of communist ideas and the utilization for this end of the apparatus and resources of governmental power.⁶

The plan for educational activity in the villages included three aspects: communist propaganda, general education (literacy) and agricultural education. It was laid down that "general education, in-school and out-of-school, must be closely linked to communist propaganda, There is no form of science or culture which cannot be linked with the great ideas of communism."⁷ At the First All-Russian Congress on Extra-School Education in May 1919 (Lenin spoke, referring to 'free education, free development')⁸ it was agreed that all adult schools must take on the task of developing the class-consciousness of the workers and peasants, of transforming them into active workers for socialist construction and world communism. A system of literacy schools, to involve illiterates from age 15 upwards, was visualized. They were to attend for three months. A system of elementary schools for adults was also planned, these would provide a broader based curriculum to be studied for longer periods.

On 26 December, 1919, Lenin signed the famous decree *On the Liquidation of Illiteracy Amongst the Population of the Russian Soviet Federal Socialist Republic*. This decree completed the plan for the basic tasks drawn up by the People's Commissariat of Education. In defining the measures of urgency facing the new government they projected compulsory education for all children; the establishment of a system of teacher-training; a unitary system of lay schools; equality of instruction to the highest level for all citizens; the struggle for universal literacy.⁹ Lenin's decree of 26 December, 1919, declared:

All illiterate citizens of the Soviet Republic aged between 18 and 50 years are required to learn to read and write in their native language, or in the Russian language, as they prefer. Tuition will be provided in the existing state schools and in certain others which will be established for the illiterate in accordance with the plans of the People's Commissariat of Education.¹⁰

The decree was distributed in hundreds of thousands of copies in the factories and villages. Slogans and posters to launch the campaign were drawn up by artists, poets and writers. Slogans such as the following were highly commended as striking the essential note of simplicity and urgency: 'Down with Illiteracy!'; 'Illiteracy is the twin sister of national ruin!'; 'It is the citizen's right and duty to be literate!'; 'Literacy is the road to Communism'.¹¹

Hundreds of thousands began to study, both young and old. Voluntary teachers, drawn from the ranks of school teachers, office personnel, educated workers and trade unionists, senior pupils of secondary schools and demobilized servicemen, were paid at rates equivalent to a teacher's salary. Illiterates, whether men or women, were allowed two hours off work every day with full wages to attend classes. Clubs, factories and offices set aside special rooms for study. It was made a criminal offence to prevent an illiterate from attending school. The trade unions, communist party, young communist league and women's organizations were very closely associated with the work. That spirit of enthusiasm so characteristic of the early days of the revolution took hold of the masses of the people in relation to the government's plans, Krupskaya noted that it was unnecessary actually to expound the benefits of knowledge: the real problem was to provide adequate facilities to satisfy the general craving for culture and the thirst for knowledge.¹²

On 19 June, 1920, an *All-Russian Extraordinary Commission for the Liquidation of Illiteracy* (Gramcheka) was set up to co-ordinate the efforts of all engaged in the work. It had very extensive powers: to register the illiterates in their homes and factories, to devise appropriate methods of instruction for the adult illiterate, to prepare textbooks and reading books, to enlist the help of people specially qualified to carry out the work. Lenin's slogan, "to mobilize every literate for the war against illiteracy", swept the country. Activists, in many cases themselves only recently literate, threw themselves into the work. Agitators in factories, villages and offices exerted psychological pressures of all kinds on literates and illiterates alike to further the campaign. On 2 October, Lenin spoke to the Young Communist League:

Everybody is talking about abolishing illiteracy. You know it is impossible to build a Communist society in a country where the people are illiterate. It is not enough for the Soviet Government to issue an order, nor for the Party to launch a precise slogan, nor even to assign a certain number of the best workers to this job. The younger generation must take up this work. Communism implies that the youth, that is, the men and women of the Young Communist League, shall say: This is our task. We will unite and go into the country and abolish illiteracy.¹³

Lenin managed by this appeal to tap the energy and enthusiasm of 400,000 members of the League, enrolling them in a nation-wide crusade against backwardness and superstition.

The Extraordinary Commission had powers to prosecute illiterates who refused to take advantage of the facilities available. A fine of up to \$250 could be levied.¹⁴ But the pressures exerted were of a moral and social character, the legal sanction was held in reserve for especially obdurate and recalcitrant citizens. The practice of forming mixed classes, of illiterates and semi-literates, was soon abandoned. A system of 'streaming' by age and achievement was introduced. This was justified in terms that older people did not like to be in classes with young illiterates where their illiteracy and difficulties of understanding were exposed. It was discovered that not only those who made little progress but also those who were in advance of the others became discouraged and gave up before full literacy was attained. The adult students were therefore divided into groups according to whether they were totally illiterate, whether they could read but not write, whether they could read and write but knew no arithmetic. Those unable to attend regularly were given individual instruction at home or at work. In the case of illiterate nomads, as in Central Asia, teachers would follow the tribal group around until everybody was literate.

On 12 November, 1920, the *Glavpolitprosuyet* (Supreme Committee for Political Enlightenment) was set up as an organ of the People's Commissariat of Education. On 3 November, 1920, Lenin defined the tasks of political enlightenment: he returned to the theme once more at the congress of *Politprosuyety* the following year, on 17 October, 1921:

While we have a phenomenon such as illiteracy in our country, it is very difficult to say anything about political education. Literacy is not a political problem, but the very foundation without which it is impossible to speak about politics at all. The illiterate remains right outside of politics; to begin with it is necessary to teach him the alphabet. Failing this, it is not possible to have any politics at all; failing this we can have rumours, gossip, fairy-tales, prejudices, but we cannot have politics.¹⁵

The Tenth Plenum of the Communist Party of the Soviet Union had given the *Glavpolitprosuyet* the task of organizing agitational and propagandist work. This was considered to be possible only by combining this work with that of raising the level of culture in towns and villages. In other words, the question of literacy was involved. In 1922 it became possible to discover the extent to which this task had been effectively achieved on the basis of the report of the 1920 census which was published in that year. Lenin compared the literacy figures for 1920 with those of 1897.¹⁶

TABLE 1
LITERACY FIGURES—1897 and 1920 COMPARED

	Literates per thousand					
	Male		Female		Both	
	1897	1920	1897	1920	1897	1920
1 European Russia	326	422	136	225	229	330
2 North Caucasus	241	357	56	215	150	281
3 West Siberia	170	307	46	134	108	218
Totals	318	409	131	244	223	319

Lenin’s comment is typical of his political realism:

While we are chattering about proletarian culture and its relation to bourgeois culture, life presents us with figures which show that things are bad with us even in regard to bourgeois culture. It turns out, as was expected, that we are still very backward in respect of general literacy and that our progress, even compared with Tsarist times, has been too slow. This should serve as a severe warning and reproach to those who are soaring in the empyrean heights of ‘proletarian culture’. It shows what imperative spade-work still confronts us if we are to reach the level of an ordinary West European state. It also shows us what an enormous amount of work confronts us today to achieve anything like a real cultural level on the basis of our proletarian gains.¹⁷

In that part of the report on the New Economic Policy which dealt with the tasks of the Political Education Departments, which Lenin delivered in October 1921, he was even more scathing about the work of these *Politprosvyety*:

You adopted the title of political educators. When you took this name you were warned not to use such a high-sounding title, but something more modest. But you insisted on being called political educators, and it implies a great deal. You did not undertake to teach people the alphabet; you undertook to educate them politically. You may be told, “It’s a good thing you are teaching people to read and write and carry on economic campaigns.” That is all very well; but it is not political education, because political education means summing up all this.¹⁸

The First All-Russian Congress for the Liquidation of Illiteracy convened in Moscow, in February 1922.¹⁹ There were 146 delegates drawn from 44 provinces, from various army groups, and from central institutes. The executive committees of a number of trade unions were also represented. It was now just over two years since Lenin had signed the literacy decree. A tremendous amount had been accomplished in this short time. More than five million people had become literate as a result of the ‘crash’ programme. In the Red Army, illiteracy had been reduced from between 65 and 70 percent to something between 5 and 6 percent.

If we recall at this point that the Soviet Government had been involved in civil war and in repelling the armies of intervention throughout this time, the figures represent a tremendous achievement. It is true that in the case

of non-Russian nationalities the decrease in illiteracy was very much less. This was in part because the work with these peoples was hampered by the fact that many of the nationalities were not only without a literature—in some cases they even lacked an alphabet. As a matter of fact, the non-Russian groups were hardly involved in the first stages of the campaign: their illiteracy remained almost total. As the 1920 census revealed, another black spot was the position of women. Except in European Russia, and in certain national groupings which had a long-established cultural tradition they lagged far behind the men.

The congress delegates decided that the special *likpunkty* ('illiteracy liquidation points') which had been set up anywhere at all where people could be contacted—in a factory or office, the hallway of an apartment house, the landing of a tenement, even on a street corner in summer—should continue to operate. It was proposed that *likpunkty* should function for four months, and that the regular schools for the poorly literate should work a six month session, six to eight hours daily. Besides readers and textbooks, the delegates recognized that other teaching aids could be usefully employed. Posters and broadsheets, cards, calendars, newspapers, reference books, and circulating libraries should be made freely available to students. Having in mind the prime object of literacy education, to involve the masses in cultural and political activities, special libraries were made up dealing with political, social and cultural affairs, and special newspapers were published in a simplified style and vocabulary for the semi-literate and newly literate adults.

With respect to the teaching method deemed appropriate in the teaching of illiterate adults, the Congress recommended 'as the practical and theoretical basis of this work the method of unbroken words'. This is what used to be known as the 'look-and-say' method. Certain mistakes which had been made were pointed out. Most commonly this consisted in the use of the same techniques and materials with the adult student as were used with the child beginning school. This error had already been strongly criticized by the Central Committee of the Communist Party: the Congress re-affirmed this criticism.

With reference to the political side, certain decisions were taken. It was re-asserted that the elimination of illiteracy was intended to lay the foundation for political enlightenment. Responsibility for the campaign was therefore placed on the *Glaupolitprosuyet*. It was also recognized that urban labour productivity depended on general literacy: in the country literacy had to be linked with agricultural education. The dissemination of elementary facts about hygiene and disease in both town and country would help to increase labour productivity and would destroy superstitious views and practices. To enable a wider participation in the campaign it was proposed that *Gramcheka* (the illiteracy commission) should establish a connection with the Communist Party, Trade Unions, the Red Army, Young Communist League, *Zhenotdel* (the Section of Party Organization for Social and Political Work amongst Women) and with the corresponding organizations of the different national minorities. The decision was taken by Congress to eliminate illiteracy in the Red Army by 1 May, 1922.

The problem of the almost total illiteracy of the non-Russian national

minorities had now assumed great political importance. In many cases, the main difficulty was the absence of a written language. In addition there was an almost total lack of suitable materials (texts, readers, newspapers, etc.) in non-Russian languages, as well as a dearth of teachers with a knowledge of the language and some familiarity with the life of the particular national minority. It was decided as the basic policy that instruction must be in the native language. This, of course, was an absolute reversal of the Russification policy of the Tsars and followed directly from the declared aim of one hundred percent literacy.

At this period the Soviet Union numbered over 140,000,000 people, of these, 65,000,000 were non-Russian. The policy of Tsarism had been to destroy the political organizations of the subject races, to forbid absolutely, or drastically to restrict, the use of the native language in schools, courts and in the administration. It sought to cripple the native culture and to keep the great majority of the subject people in a state of ignorance. The theses accepted by the Tenth Party Congress in 1921 declared the policy of the Soviet Government to be that each national minority should establish its own Soviet State system, in forms consistent with its own national character. Lenin's slogan was: 'Nationalist in form, socialist in content'. This meant that the courts and other administrative and executive organs should function in the native language and be recruited from the local people; that a popular press, schools, theatres, clubs, cultural and educational institutions should be established in the native language. A roll-call of some of the national groupings incorporated in the Soviet Union at this time will give some indication of the magnitude of the task the Soviet Government had assumed: Ukrainians, White-Russians, Kirghiz, Uzbeks, Turkmens, Tadjiks, Azerbaidjanis, Tatars, Bokharans, Khivans, Bashkirs, Armenians, Chechens, Kabardians, Ossetians, Circassians, Ingushes, Karachais, Balkarians, Kalmucks, Karelians, Avarians, Darghis, Kazikumukhians, Kurins, Kumyks, Marsis, Chuvash, Volga Germans, Buryats, Yakuts, and many others. Some of these national groupings were quite small, in some cases less than a thousand. In others, whole nations with a long history and a highly-developed cultural tradition, spread over a vast territory, and including many millions of individuals, were involved.

The Second Congress for the Liquidation of Illiteracy took place between 20 and 24 May, 1923.²⁰ Representatives of 45 provincial governments and 17 republics were present, as were delegates from the Red Army and Trade Unions. The reports bore a different aspect to those of the preceding congress. In each case, the basic reports were made jointly, as from a work-place and also from an organization such as the Trade Union, Red Army, Militia, *Zhenotdel*, Young Communist League, and so on. This is a sign of a broader participation in the organization of the campaign at grass-roots level. The Congress went on to take the important step of adopting a central plan of campaign which had been worked out by the *Illiteracy Commission*. Control dates by which certain basic tasks should be accomplished were set up. For instance, 7 November, 1927, was set as the deadline for the elimination of illiteracy: in towns everybody between 18 and 35 years; in villages all between 14 and 30 years. Similarly, all members of Trade Unions were to be literate by 1 May, 1925. The

elimination of illiteracy in the Young Communist League and *Zhenotdel* was regarded as being specially urgent.

The campaign was to be waged under the single leadership of *Gramcheka*. It was resolved that more than a thousand schools should be set up to train teachers of adult illiterates.

In 1923 a voluntary organization called the *Down with Illiteracy Society* was founded. Its object was to help in every possible way to promote the campaign. It directed the work of thousands of *Kultarmeitz* or 'soldiers of culture'. Membership was open to all citizens over 18. The Society was especially active in the villages but it organized branches in factories and offices as well. In 1924 Mikhail Kalinin, President of the Soviet Republic, was elected chairman. The Society published textbooks and readers. It also published special newspapers for its members and for the newly literate. Members paid dues and carried on the work of combating illiteracy as unpaid volunteers. The Society was given considerable support by the State. On 30 May, 1925, the Central Committee of the Communist Party published a decree outlining the tasks and successes of the society.²¹

The principle of voluntarism, of which the *Down with Illiteracy Society* (O.D.N.) is a typical representative, assumes an interesting form in the Soviet Union. Normally the voluntary organization has a massive membership: this includes a minority of Party members. There is a small annual subscription. Immense numbers of people are involved, but at a fairly superficial level. The voluntary organization strongly supports particular campaigns which have been declared to be urgent and of fundamental importance by the government. The voluntary movement is closely linked with the short term, and with the final aims, of the Communist Party. It is closely guided by the policies and personnel of the Party, although in the normal way decisions are arrived at freely by the membership.²²

At its first congress in 1925 1,600,000 active members were represented. Large numbers of these were also members of the Young Communist League which had taken the literacy campaign over as its special task. At this time the O.D.N. Society had 28,000 'cells' of active workers. It had published 5 million readers and a library for the newly literate. It assisted the People's Commissariat of Education (*Narcompros*) to organize local conferences to discuss organizational problems, the kinds of teaching materials needed, and the methods appropriate to the adult illiterate.

In 1925 an All-Union Methodological Conference was organized. The main purpose of this conference was to evaluate programmes and methods of teaching and to discover and declare the specific features of method appropriate in teaching adults. As has been already indicated, the major difficulty arose from the fact that many teachers were transferring unthinkingly their school techniques and materials to the adult situation. Krupskaya laid down the basic principles of adult teaching, as follows:²³ first of all, there must be *economy* in the use of time. As much as possible must be given in the shortest possible time. This means that the material of the lesson must be organized so that the student makes maximum progress. At the end of each lesson he must be told exactly what he has learned. Secondly, the material must be *interesting*, and related to the

student's future reading habits. This implies that adults should graduate to newspaper reading at an early stage. There is therefore a basic need for simple, specially designed newspapers for the poorly and newly literate. The students should copy into their notebooks short articles from these special newspapers, they should also record their own thoughts in short independent essays. Thirdly, the students should be trained early in the *use of books*. They should learn to use dictionaries, reference books, catalogues, and so on. Fourthly, literacy teaching should be linked closely with *other cultural activities*. In particular, Krupskaya advocated the reading of folk-tales.

An analysis, on a commonsense or "holistic" level, of the psychological features of the adult learner was presented at this conference as a guide to the most appropriate method of instruction. The psychology of reading and its relation to writing were worked out. The 'phonic' method was regarded as fundamentally unsound. The superfluous movements of the speech organs involved in pronouncing separate letters or groups of letters hampers correct pronunciation. The method of recognizing and pronouncing 'whole words' was considered to be superior. But, after mass trials, this method too was discovered to be relatively ineffective:

The whole-word method ('look-and-say' JML) proved unsuitable for Russian schools, especially for the tutoring of illiterate adults. This was for the following reasons: the process of instruction becomes purely mechanical; the method relies chiefly on memory and calls for the learning of many words by heart; it takes too long.²⁴

A method which combines the phonic and the 'whole-word' methods was worked out. This was called the analytic-synthetic method. It consists of dividing the word into syllables, and the syllables into sounds. The word is made up by the student from special cardboard letters, it is read and written down. This method places great stress on individual work and the materials were so constructed that each student could proceed at his own pace. The method has the major advantage that it frees the adult from rote-learning, this being the main defect of child-oriented techniques. Methodologically speaking, the most relevant feature is that it links up very closely the two processes of reading and writing. It allows the two skills of reading and writing to develop together gradually.²⁵

The problem of relating the teaching of reading to the interests of the adult and to the needs of the State was solved in characteristic fashion. The first textbooks and readers were intended for illiterate Red Army men. These consisted of slogans designed for simplicity and for developing morale and 'political consciousness'. At this date they appear extremely crude. But if we recall that a large proportion of the students had only recently changed their peasant shirts for Army uniform, and that all of them were understanding print for the first time, we can begin to understand the enthusiasm with which they were studied by the newly literate soldiery. The following were some of the slogans used in these reading books:

My pobedyim ! (We are winning)

Rabov nye budyet u nas !

(There will be no exploitation in our land)

Chem silnyeye krasnaya armiya, tem blizhe voiny!
(The stronger the Red Army, the shorter the war)

Soyuz rabochikh i krest'yan nyenobedyit!
(The union of workers and peasants is invincible)

Kommunizm—nash fakyl pobyedy!
(Communism is our torch of victory)

In the connected reading passages the various phases of the civil war were explained in simple terms, from the point of view of the Bolshevik government.²⁶

Readers and other materials were published in the language of the different republics: Ukrainian, White Russian, Tatar, Kirghiz, Uzbek, Tad-jik, Mariiski, even Yiddish. The magazine *Down with Illiteracy* had been published twice monthly since 1920. It was followed in 1925 by *The Peasant Newspaper for New Readers*, which was published six times a month. This was a self-educator, with a large number of illustrations. Study guides were also published. In 1925 a complete peasant library (*Krest'yanskaya Bibliotyeka*) was published in many pamphlet-volumes.²⁷ These covered a variety of topics including, for example, the precautions to be taken to prevent the spread of venereal disease and other diseases, a description of the metal plough and other advanced agricultural techniques and how they could be applied to the Russian earth, propaganda for atheism, and what was obviously the central piece in the collection, a very detailed account of the history of Russia from emancipation until the Revolution, presented from the point of view of the peasant. This booklet of 72 pages was entitled *Lenin and the Peasantry*²⁸ and dealt in very plain language with the condition of the peasant under Tsarism. It sought to establish that Lenin's policy throughout his revolutionary activity had been in the best interests of the peasant masses. As a sample of the style and approach we cannot do better than quote from the account of *'How Lenin became ill and died'* which opens the argument. The peasant is informed that Lenin died of arterio-sclerosis. (Actually he died in 1923 after a succession of strokes due to cerebral haemorrhages, probably complicated by the gunshot wound of his attempted assassination by a Social Revolutionary). This arterio-sclerosis was hereditary: his father died of the same complaint, and his mother also suffered from it. (Ilya Nikolayevitch Ulyanov died from cerebral haemorrhage like his son; the mother died at the advanced age of eighty-one, of an unspecified cause.) Vladimir Ilyitch, according to our author, prepared the ground for this disease by his 'inhuman mental work'. He 'wore his brain out'.

Our dear leader died because he did not conserve his energies: he worked all his life; he was in a hurry, knowing no rest from labour. He perished as a result of his great work of liberating the toilers.²⁹

The writer, M. Kuznetsov, recounts in simple terms how Lenin became a revolutionary. He goes on to show how from his earliest years Lenin realized that the workers and peasants must unite to overthrow the oppression of Tsardom. After a homely account of Lenin's struggle against the landlords and capitalists, the author skilfully draws the reader towards the

conclusion: collective work, a still greater intensification of party work must take the place of the dead leader. The party must carry out the testament of Lenin. Workers by the thousand are coming into the Party and the peasants too must unite around the Russian Communist Party.³⁰

The growth of the campaign in these early years is shown in the following figures:³¹

TABLE 2
PROGRESS OF THE CAMPAIGN (1922-1925)

Year	No. of illiterates taught
1922	463,300
1923	123,100
1924	567,200
1925	1,383,000

According to figures issued by *Glaupolitprosuyet*, the distribution of literacy by age on 17 December, 1926, in European Russia was as follows:

TABLE 3
PERCENTAGE OF LITERACY ACCORDING TO AGE GROUPS

Age group	Total	Literate	Illiterate	Percentage literate
0- 7 yrs.	17,404,889	140,185	17,264,704	0.8
8-11 yrs.	6,256,923	2,949,794	3,307,129	47.1
12-15 yrs.	8,617,068	5,565,681	3,051,387	64.5
16-34 yrs.	26,797,078	18,456,297	8,340,781	68.9
35-49 yrs.	11,822,509	6,006,568	5,815,941	50.8
50+	11,095,261	3,053,174	8,042,087	27.5

As in the figures published in 1897, illiteracy was worst amongst village women, village men and town women. This is brought out in the following figures:³²

TABLE 4
PERCENTAGE OF LITERACY ACCORDING TO LOCATION

Age Group	Town Males	Town Females	Village Males	Village Females
8-11 yrs.	78	76.7	49.5	34.9
12-15 yrs.	91.7	83.3	72.5	47.4
16-34 yrs.	94.7	83.7	81.6	47.4
35-49 yrs.	90	62.2	71	21.1
50+	74	39.4	42.2	7.5

At the beginning of 1926 adults of the following nationalities were receiving instruction in reading and writing:³²

TABLE 5
PROVISION MADE FOR NATIONAL GROUPS: 1926

Ukrainian SSR	540,900
White Russian SSR	36,000
Azerbaijan SSR	29,600
Georgian SSR	67,600
Armenian SSR	18,800
Turkmen SSR	7,700
Uzbek SSR	26,300
Tadjik SSR	500
Kazak SSR	23,200
Kirghiz	7,500

Special provision was made for mothers of large families and others unable to visit even the *Likpunkty* for instruction. Special creches were established, and teaching was given in quite small groups. Individual tuition at home by volunteers was also common. It was a principle that no one should be deprived of the opportunity of literacy because of his or her living or working conditions.

Literacy teaching was linked to more advanced instruction. Courses and schools were organized to raise the *political* level of the population in terms of Communist principles. Provision was also made for raising the general level of education, especially of workers, peasants and Party workers. For example, one-year and two-year general education courses and 'political literacy' schools were organized in great numbers to further the education of the newly literate. Promotion schools, *Rabfaks* (workers' faculties in Universities and Institutes of Higher Education), Communist Party schools for Marxist education (*Sovpartshkoly*) involving hundreds of thousands of active workers, mostly Communist Party members, were established.³³

Throughout the early years of the Revolution a millennial enthusiasm surrounded the campaign to eliminate illiteracy. Literacy was considered the key which would open all the doors of science, culture and prosperity. Lenin had proclaimed the notion of building a Communist society to be unthinkable with an illiterate population. It seemed to be a corollary that literacy teaching was bound up with progress towards Utopia. To the insatiable curiosity of the Russian *muzhik* was added the dimension of Messianism: these were the subjective driving-forces of the campaign.

In late 1926, at the Fifteenth Party Congress, the question of education came up in the context of the problem of bureaucratization of the State apparatus. Immediately before the conference Max Eastman had published what purported to be Lenin's last will and testament in the *New York Times*.³⁴ This had been written when Lenin's work had to be broken off completely due to ill-health. Since 1921 he had observed the growth

of the bureaucracy under Stalin. In 1923, in the middle of his long illness, he had written:

Our state apparatus is very largely a survival of the old, and has least of all undergone serious change. It has only been slightly repainted on the surface, but in all else it is a typical relic of our old state apparatus.³⁵

At the Fifteenth Congress the struggle between Stalin and the Opposition was waged with special virulence, probably as a result of Trotsky's incautious remark in the Central Committee that Stalin was playing the role of 'gravedigger of the Revolution'.³⁶ Trotsky spoke at the Congress of the 'bureaucratic deformation' of the workers' state.³⁷ Stalin also referred to these matters in his speech:

The cultural development of the working class and the toiling masses of the peasantry does not only mean the development of literacy, although literacy is the basis of all culture. Besides this it means the acquisition of habits and the ability to participate in the work of directing the nation. It is the basic lever of betterment of the governmental and all other apparatus. In this lies the significance and meaning of Lenin's slogan on the cultural revolution.³⁸

The same Congress directed all State institutions to proceed with drawing up a Five Year Plan of development. The directives recognized that industrialization and collectivization could be achieved only if there were an extensive and decisive raising of the cultural level of the industrial workers and peasants. The development of the national minorities was also a basic pre-requisite to socialist industrialization. The economic revolution could be achieved only on the basis of total literacy. Equally basic was an increase in the provision of general education and the greatest possible extension of technical education. The need for qualified specialists and scientific workers drawn from the common people was stressed as a pre-requisite for the development of a modern, industrial state.³⁹

Following the Party Congress there was a significant increase in the activity of organizations specially devoted to the elimination of illiteracy. The Young Communist League in particular, at its Seventh Congress, was active in passing resolutions: to eliminate illiteracy in the *Komsomol* itself, to mobilise and train 1,000 *Komsomols* for literacy work, and to ensure that each *Komsomol* should find and teach at least *one* illiterate. A month's campaign was projected for August 1928 to implement these decisions. As a result, thousands of young people became active in the *Down with Illiteracy Society* as volunteer teachers and propagandists. Kalinin, Krupskaya and Maxim Gorki played a very active role in the campaign, writing many articles and addressing hundreds of meetings on the subject of illiteracy.⁴⁰ The slogan: Literates—teach one illiterate! became a central theme and helped to give the campaign both a national and individual impulse. The political significance of the work was kept in the foreground. Kalinin wrote:

In literacy teaching, all the work must be permeated by the political views of the revolutionary proletariat—otherwise expressed, by the revolutionary theory of Marxism-Leninism.⁴¹

From 1927 a new feature of the campaign was the special attention

given to semi-literates and to the newly literate, to prevent any slipping back. In thousands of cases previously, no provision had been made to ensure that the new skills should be consolidated by use until they became habitual. Many 'soldiers of the cultural army' had been sketchily trained or had received no training at all. Thus the massive figures of millions of successes, taken at face value, concealed the reality that thousands of clients were very poorly educated in the new skill and that many thousands soon relapsed into semi-literacy or illiteracy. This accounts in part for the increased stress on the ideological aspects of literacy teaching. The newly literate worker or peasant was encouraged to see Soviet Russia as a new and exciting society emerging from the semi-feudal realm of darkness of Tsardom.

Based as it was on a revolutionary doctrine laced with an explosive Messianism, Marxism represented for the newly literate at once an intellectual challenge and a complete way of life to which he could dedicate his energies, abilities and enthusiasms. For those of lesser altruism there was the possibility of a career in the service of the State. Reading and writing were not mere academic exercises, complete in themselves. Literacy was instinct with social purpose. It was a means of personal advancement in a worthy and socially acceptable cause. It had all the fascination of something at once novel and accepted. It was a sure means to personal advancement and to the enjoyment of the world's treasures of mental culture.

For the participants, the Soviet literacy campaign combined the appearance of a military campaign and a spiritual crusade. It developed its own mythology and martyrology. The remark about Lenin working himself to death, wearing his brain out in the service of the people, has already been quoted. Literacy teaching, especially in the backward nationalities and in the cultural hinterlands of peasant life, was an enterprise not without danger. This was especially true when the campaign was linked with propaganda against the *kulaks* and Nepmen. The activist of the *Down with Illiteracy Society* Nina Sanko who was killed by the 'class enemy' in the course of this work was held up for emulation to the 'Young Guard' of the *Komsomol*.

On 17 May, 1929 the Central Committee published another decree *On the Task of Liquidating Illiteracy*.⁴² This emphasized the need for a unified plan and a unified organization. Instructions were sent down to all Party organs, to trade unions and the *Down with Illiteracy Society*. These were: to step up the campaign in general; to concentrate on the industrial worker in the towns; in villages to pay special attention to the farm labourers, to *Sovkhozniks* (State Farm Workers), seasonal workers, poor peasants and collective farmers. A network of schools was to be established for the poorly literate: here they could obtain a general education and any 'slipping-back' could be prevented.

In June the Eighth All-Russian Congress on the Elimination of Illiteracy accepted these as the future tasks of the O.D.N. The fact that the same administrative and field work problems continued to be discussed by the different organs of state power and by the voluntary organizations illuminates the continuing difficulties of co-ordination of plans. The Party

Congresses, various Party Committees, several Ministries were simultaneously publishing decrees, directives, plans, commendations and criticisms. A large number of paper-plans for an ideal system of division of labour were drawn up. But in spite of administrative interventions the field work made progress. The 'cultural shock-troops' advanced and occupied enemy positions, the long war of attrition against illiteracy and backwardness made progress.

In 1930-1931 a general agreement was reached between all the participating organizations. These included the Young Communist League, the Trade Unions (who contributed 6 roubles per member for literacy teaching and 12 roubles for educating near-literates), student organizations, professional associations of scientific workers, numerous societies and institutions for popular education, teachers, organizations, publishing firms such as *Gosizdat* and *Tsentrizdat*, the Proletarian Ramblers' association, *Radiotsentr*, *Soyuzkino* and many others. This general agreement on strategy carried the campaign to a new level. Specific decisions were: that all organizations should co-ordinate their work in accordance with a detailed plan so that an all-out campaign against illiteracy could be mounted; the campaign would be based on 'socialist competition', that is, each group would accept a target of achievement in competition with all other groups; reports of progress would be published regularly so that each group could see its achievement in relation to the total picture and be constantly encouraged to improve on its performance; the competition would cease on a fixed date, when various rewards in the form of banners, medals, citations etc. would be distributed. Constant and close supervision of lower level organizations by higher ones would ensure steady progress. The extent to which targets were being achieved would be analysed regularly and inhibiting factors removed by 'shock' tactics.

The organizations involved agreed to mobilise and educate two million 'soldiers of culture'. Special attention was to be paid to their political education and to making them understand not only the short-term programme but its ultimate aims. The two million 'soldiers of culture' were to be mobilised according to the following control figures:

TABLE 6
COMPOSITION OF THE PROPOSED "ARMY OF CULTURE" (1931)

Trade Unions	600,000
Young Communist League	250,000
Down with Illiteracy Society	550,000
<i>Proletstud</i>	70,000
<i>ONO</i> (Society for Popular Education)	500,000
<i>Vsekomprofsoyuz</i>	30,000
TOTAL	2,000,000

This tremendous plan⁴³ was put into operation in the ensuing period. It was a central component of the unitary plan to transform Soviet

society industrially, socially and politically. The entire campaign was controlled by the People's Commissariat of Education. Each national republic, each region, district, school, teacher and student was expected to compete against all the others in completing and overfulfilling their 'quotas' of educated illiterates by the control dates. The subjects of this intensive effort were examined by inspectors from the local education departments: if successful they were awarded certificates of literacy.

Simultaneously with the all-out campaign notable changes were taking place in the school system. On 5 September, 1931 and again on 25 August, 1932, the Central Committee issued decrees on the primary and secondary schools. These aimed to abolish the anarchy that existed in the schools following on the Revolution and to give control back to the teachers. Doctrines of the 'withering away of the school', the project method, the Dalton plan, and many other kinds of 'experimental education' were condemned as aberrations which had to be abolished from the school system. Formal methods of teaching were reintroduced, clear aims and directives were given to teachers about standards, methods and content of school-work. Discipline of an authoritarian type was re-established and a strong centralized control was instituted, very similar to that of Tsarist times. The Communist ideal was placed sharply before teachers and pupils. Examinations and grading were reintroduced. The educational ideal was stated in a keynote speech by Zalkind:

We need a socially 'open' man who is easily collectivised and quickly and profoundly transformed in his behaviour—a man capable of being a steady, conscientious and independent person, politically and ideologically educated.⁴⁴

Shulgin, the main protagonist of the theory of the 'withering away of the school' had the *Marx-Engels Institute of Pedagogy* dissolved from under him. A number of other individuals found that their talents had become redundant. Conservatism, Stalinist in form, was established as the ruling force in education, as in society generally. The bureaucratic system inherited from the Autocracy asserted its dominance over the revolutionary impulse. At this time all criticism of policy and of the leadership had been silenced: the Opposition within the Party had been suppressed. Trotsky was expelled from the territory of the USSR in February, 1929. The 'Right Deviation' of Bukharin, Zinoviev and Kamenev was crushed and discredited. The 'Left Opposition' had long before been obliterated.⁴⁵

The First Five-Year Plan, initiated in 1928, was officially declared at an end on 31 December, 1932, four-and-a-half years later. According to Stalin's figures industrial development had been fulfilled up to 93.7 per cent of the plan.⁴⁶ *Gosplan* reported that the plan to teach 8,200,000 illiterates and near-literates had been achieved two-and-a-half times over. Kalinin, writing to the organizations concerned in 1934, asserted:

The elimination of illiteracy in our country is basically completed. More than nine-tenths of the population can read and write in their mother tongue.⁴⁷

Stalin recorded an increase in literacy from 67 percent in 1930 to 90 percent at the end of 1933. At the Seventeenth Party Congress, the 'Congress of Victors', he reported on 26 January, 1934:

From being an agrarian country we have become an industrialized state . . . From being a land of darkness, illiteracy and lack of culture we have become a literate and cultured people, with an enormous network of primary, secondary and higher schools, operating in the national languages of the USSR.⁴⁸

According to official figures, 90 percent literacy had been achieved in a tremendous end-spurt during the crucial year, 1932. More than 14 million adults were taught to read and write during this year, compared with only nine and a quarter millions the year before. This should be compared with the figure of less than nine millions in the year following the completion of the Five-Year Plan.⁴⁹

In the years following 1934 the campaign continued. Certain areas of illiteracy remained to be mopped up. Peasant women and the non-Russian nationalities which had newly emerged from a nomadic condition were black spots: they provided more millions for the 'soldiers of culture' to deal with. In 1935 the movement for the rationalization of production associated with the name of Stakhanov was initiated in the Donetz region. Alexei Stakhanov was originally an illiterate miner. Using techniques devised by American efficiency experts, especially Taylor and Gilbreth (the use of modern machinery to the fullest extent, devising the most rational division of labour possible, employing skilled workers only in their specialist capacities) he increased the output of coal in one shift from an initial 7 tons to 102 tons. This feat was hailed as 'the first beginning—still feeble, it is true, but nevertheless the beginning—of a rise in the technical and cultural level of the working-class'.⁵⁰ The Stakhanovite method was hailed as the harbinger of those new techniques which would abolish the distinction between mental and manual labour.

TABLE 7
NUMBERS OF ADULTS INSTRUCTED

Year	Illiterates	Near-literates	Total
1927	1,351,500	189,100	1,540,600
1928	1,247,500	218,700	1,466,200
1929	1,799,600	256,200	2,055,800
1930	5,771,500	922,500	6,764,000
1931	6,189,800	3,065,000	9,254,800
1932	7,663,600	6,582,100	14,245,700
1933	4,770,000	4,199,600	8,969,600
1934	4,659,800	3,758,000	8,417,800
1935	3,867,700	3,844,000	7,711,700
1936	3,329,600	3,775,900	7,105,500
1937	4,086,000	4,380,300	8,466,300
1938	3,830,800	3,624,300	7,455,100
1939	3,313,200	3,636,800	6,953,000

A new fillip was given to the illiteracy campaign. In the Stakhanovite movement popular enlightenment was demonstrably associated with that increase in industrial productivity which lay at the basis of social

and individual prosperity. The literacy and productivity campaign could be carried on in terms of a novel, personalized image of service and social innovation.

The course of the campaign can be summarized in the official figures.⁵¹

It has been made clear that literacy was regarded by the Soviet communist government as a means to certain political and social ends. These may be summarized as follows: political enlightenment in accord with the tenets of Marxism-Leninism; a vast increase in material production to form the basis of the good life; the achievement of a communist society. The curriculum of the adult schools was not confined to literacy education; on the contrary. A carefully devised scheme of work was followed to lay the groundwork of a number of subjects. Krupskaya refers to this curriculum in 1934:

The general education schools for adults should bring the students to the level of the primary school in native language and mathematics (arithmetic), they should establish general habits as far as the use of newspapers is concerned, also books, libraries, the radio. They should give a unified knowledge of geography and history. This should include knowledge of our native country and of the world, without which it is impossible to achieve any sort of independent, self-educative work or any sort of social-political work.⁵²

In the schools for illiterates instruction in reading and writing was for a total of 200 hours, in arithmetic for 130 hours. In the schools for semi-literates 145 hours of instruction in the native language was given. This covered not only reading and writing, but speech training, oral and written composition, the drafting of memoranda, grammar, orthography and sentence construction. Geography was taught for 60 hours: this covered physical and human geography, and was designed to give a detailed knowledge of the distribution of land and sea and of the USSR. As People's Commissar for Education since 1929 N. K. Krupskaya gave special attention to the curriculum and methodology for teaching adults.

The special measures adopted to establish literacy in the national minorities are reflected in the fact that in 1931 textbooks were printed in 104 languages of the national republics. Certain languages which had no written alphabets were provided with them. Latin or Russian script was used, whichever reflected the phonetic structure of the language better. In this way such people as the Chuvash, Tatar, Karelian, Bashkir amongst others, were brought under the aegis of world culture. Thousands of Russians and non-Russians were drawn into active social life at the national level for the first time. Thousands became specialists of one kind or another. Women were liberated from their former subjection. Attempts were made to abolish purdah and polygamy, using literacy as a wedge, and woman began to take an equal place as citizen and worker.

It is interesting to notice the fact that voluntary organizations and individual citizens were involved in the campaign at grass-roots level. To give only one example, in the spring and summer of 1936 the Moscow committee of the turf-cutters' union was responsible for educating over 6,000 illiterates and nearly 8,000 near-literates. they provided 50 teachers for whom short training courses were organized, and 350 'soldiers of culture'.

It is important to remember that the dry statistics referring to millions of illiterates taught actually reflect the end-product of millions of acts of individual initiative and service. The remarkable technical achievements of the Soviet state are based on the success of the mass campaign to abolish illiteracy.

According to the census report, in 1939 the literacy rate for those between 9 and 49 years stood at 89.1 percent. In the case of the male population it was 95.1 percent.

Thus was realized Lenin's proposal and promise of 26 December, 1919, to liquidate illiteracy in the territory of the USSR and 'establish the possibility for the whole population to participate in our political life'.

- ¹ Ivanovich, V. (1906) pp. 38-55, especially p. 42.
- ² Ivanova, A. M. (1949) p. 7, quoting Guryevitch, A. in *Vneshkolnoye Dyelo*, 1924, p. 207.
- ³ *Ibid.* p. 3.
- ⁴ Krupskaya, N. K. (1922) p. 175.
- ⁵ Lenin, V. I. *Sochineniya*, 3rd edition, vol. 27, p. 51.
- ⁶ *Programma i Ustav Vsesoyuznoi K.P. (B)*, Moscow, 1938, P. 28.
- ⁷ *V.K.P. (B) v rezolyutsiyakh*, Moscow 1940 vol. 1, p. 309.
- ⁸ Lenin, V.I. *op. cit.* vol. 24, p. 275.
- ⁹ Volpicelli, L. (1954) p. 19; decree of 29 October, 1917.
- ¹⁰ *Sobranie Ukazov* 1919, no. 67, p. 592.
- ¹¹ Ivanova, A.M. (1949) p. 14.
- ¹² Krupskaya, N.K. (1938).
- ¹³ Lenin, V.I. *op. cit.* vol. 35, p. 395.
- ¹⁴ Ivanova, A.M. (1949) p. 15.
- ¹⁵ Lenin, V.I. *op. cit.* vols. 25, pp. 449-450; 27, pp. 47-48; 27, p. 51.
- ¹⁶ *Ibid.* vol. 27, p. 51.
- ¹⁷ *Ibid.* vol. 27, pp. 387-388.
- ¹⁸ *Ibid.* vol. 26, p. 166.
- ¹⁹ Ivanova, A.M. (1949) pp. 20-22.
- ²⁰ *Ibid.* pp. 22-23.
- ²¹ *Ibid.* pp. 24-25.
- ²² McLeish, J. in *Fundamental and Adult Education*, 1955, pp. 157-159.
- ²³ Krupskaya, N.K. *Sochineniya* (1932) vol. ii, pp. 88-89.
- ²⁴ Voskresenski, V.D. in *Fundamental and Adult Education*, 1959, pp. 154-172; especially p. 163.
- ²⁵ *Ibid.* pp. 163-172.
- ²⁶ Ivanova, A.M. (1949) pp. 27-28.
- ²⁷ *Krest'yanskaya Biblioteka*, Moscow-Leningrad, 1925, 32 vols. This can be seen in the library of the Society for Cultural Relations with the U.S.S.R. London, England.
- ²⁸ Kuznetsov, M. *Lenin i Krest'yanstvo*, Moscow-Leningrad, State Publishing House, 1925.
- ²⁹ *Ibid.* pp. 3-4.
- ³⁰ *Ibid.* p. 72.
- ³¹ Krupskaya, N.K. *Likvidatsiya nyegramotnosti*, 1939, ed. pp. 13-14.
- ³² *Kul'turnoye Stroitel'stvo S.S.S.R.* 1940, p. 93.
- ³³ Ivanova, A.M. (1949) pp. 31-32.
- ³⁴ Deutscher, I. *Trotsky 1921-1929*, London 1959, p. 295.
- ³⁵ Lenin, V.I. *Selected Works*, 1937, vol. 9, p. 382.
- ³⁶ Deutscher, I. *ibid.* p. 296.
- ³⁷ cf. Trotsky, L. *The New Course* (1943 ed.) pp. 36-42; Deutscher, I. *op. cit.* p. 302.
- ³⁸ *V.K.P. (B) XV Konferentsiya*, (Stenograficheski otchet) Moscow, 1927 pp. 65-66.
- ³⁹ Ivanova, A.M. (1949) pp. 33-34, quoting *V.K.P. (B) v Resolyutsiyakh i Resheniyakh*, 1940, vol. 2, p. 244.
- ⁴⁰ *Ibid.* pp. 34-35.
- ⁴¹ *VII Syezd V.K.S.M.* 1926, (Steno. Ot.), pp. 15-18.
- ⁴² *O rabotye po likvidatsii nyegramotnosti*, Pravda 24 May, 1929, quoted Ivanova, A.M. *op. cit.* p. 38.

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- Alberta Colleges Commission, (1972) (John McLeish, author) *Master Planning Monograph 7, Student Needs: Social Characteristics and Motivations of Students in Non-University Post-Secondary Educational Institutions in the Province of Alberta*, Alberta Colleges Commission, Edmonton, Alberta, pp. 439.
- Breton, Raymond, *Social and Academic Factors in The Career Decisions of Canadian Youth*, Manpower and Immigration, Information Canada, Ottawa, 1972, pp. 612.
- Brožek, J., and Slobin, D. I., (eds.) *Psychology in the USSR: An Historical Perspective*, International Arts and Sciences Press, Inc., White Plains, New York, 1972, pp. 301.
- Burston, W. H., *Principles of History Teaching*, rev. ed. Methuen Educational Ltd., London EC4, 1972, pp. 219.
- Cawley, J. F., Goodstein, H. A., and Burrow, W. H., *The Slow Learner and the Reading Problem*, Charles C. Thomas Publisher, Springfield, Illinois, 1972, pp. 311.
- Byrne, N., and Quarter, R., (eds.) *Must Schools Fail?* McClelland and Stewart Limited, Toronto, 1972, pp. 301.
- Dollar, B., *Humanizing Classroom Disciplines: A Behavioral Approach*, Harper & Row, New York, 1972, pp. 114.
- Davies, I. K., and Hartley, J., (eds.) *Contributions To an Educational Technology*, Crane, Russak & Company, Inc., New York, pp. 294.
- Economic Council of Canada, (1972) (Sylvia Ostry, editor) *Canadian Higher Education in the Seventies*, Information Canada, Ottawa, pp. 310.
- Ellingson, C., and Cass, J., *Directory of Facilities for the Learning-Disabled and Handicapped*, Harper & Row, New York, 1972, pp. 624.
- Farnham-Diggory, Sylvia, *Cognitive Processes in Education: A Psychological Preparation for Teaching and Curriculum Development*, Harper & Row, New York, 1972, pp. 630.
- Rousseau, F. L., *Inventorisez et Classez Facilement vos Documents Audio-Visuels: Easy Method for Inventory-Taking and Classification of Audio-Visual Material*, Bibliothèque Nationale de Québec, 1972, pp. 197.
- Schofield, H., *Assessment and Testing: An Introduction*, George Allen and Unwin Ltd., London, 1972, pp. 209.
- Simon, S. B., Howe, L. W., and Kirschenbaum, H., *Values Clarification*, Hart Publishing Company, Inc., New York, 1972, pp. 397.
- Stones, E., with D. Anderson, *Educational Objectives and the Teaching of Educational Psychology*, Methuen & Co. Ltd., London EC4, 1972, pp. 324.
- Stones, E., and Morris, S., *Teaching Practice: Problems and Perspectives*, Methuen & Co. Ltd., London EC4, 1972, pp. 300.

